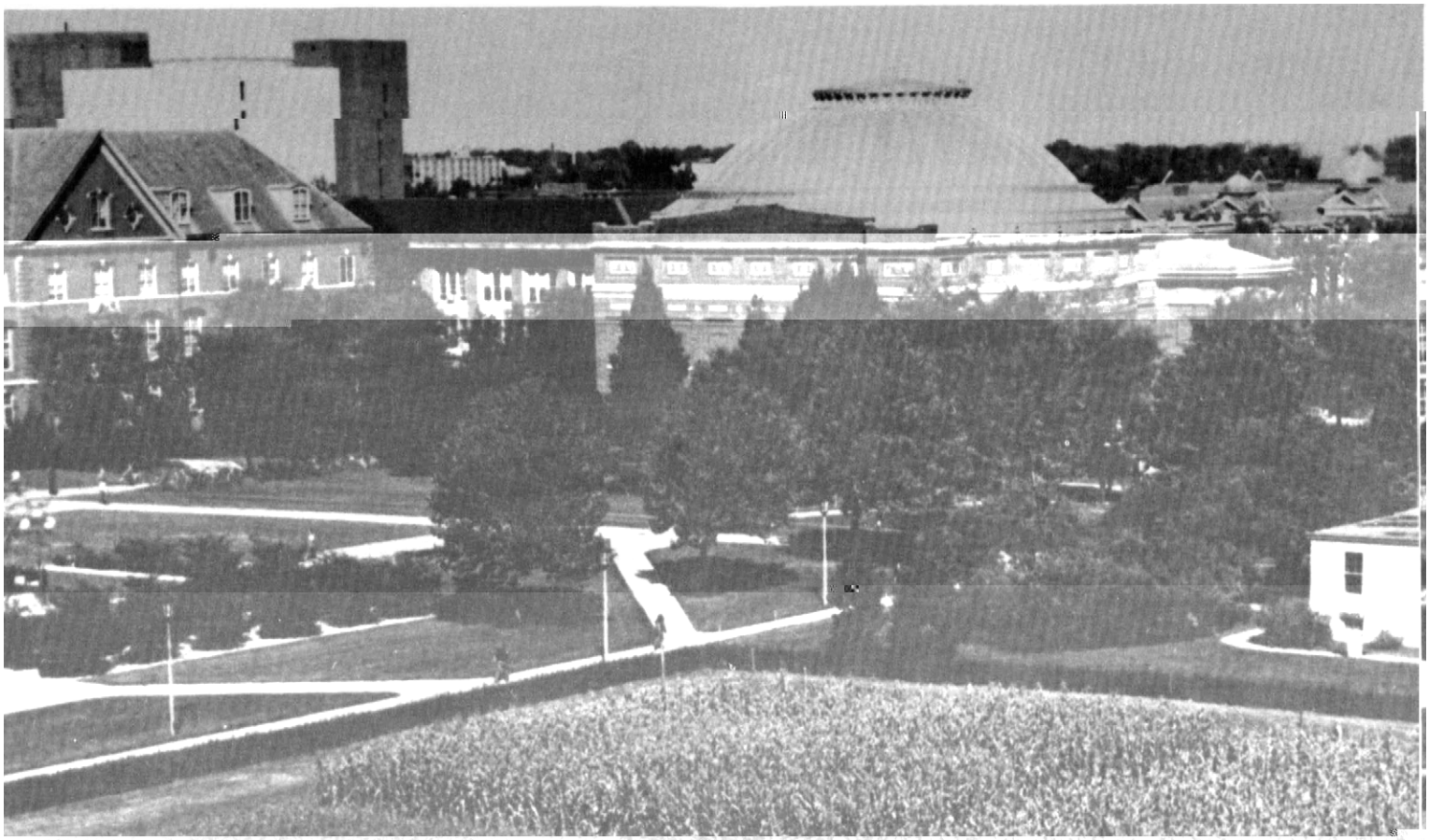
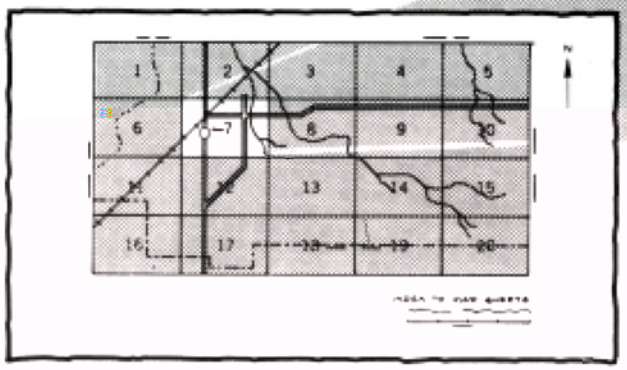
United States Department of Agriculture
Soil Conservation Service
in cooperation with
Illinois Agricultural Experiment Station

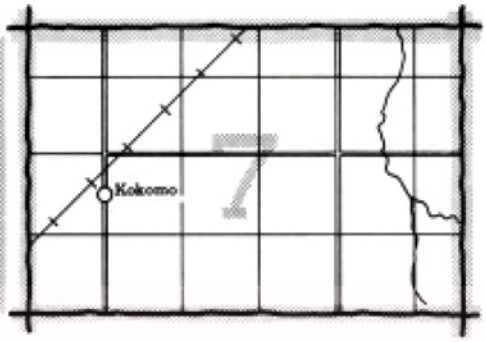
Soil Survey of
Champaign County, Illinois



HOW TO USE

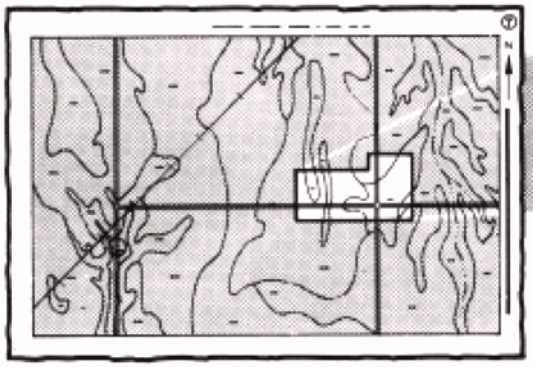
1. Locate your area of interest on the "Index to Map Sheets"

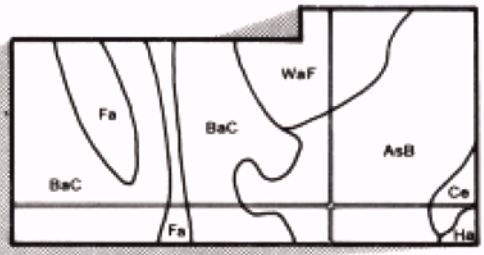




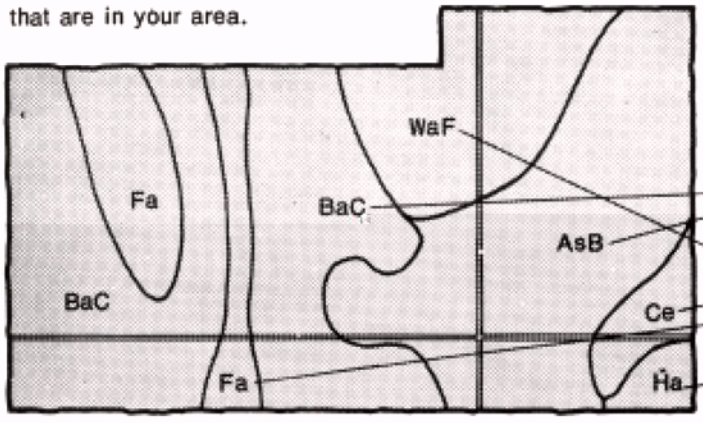
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.





4. List the map unit symbols that are in your area.



Symbols

AsB
BaC
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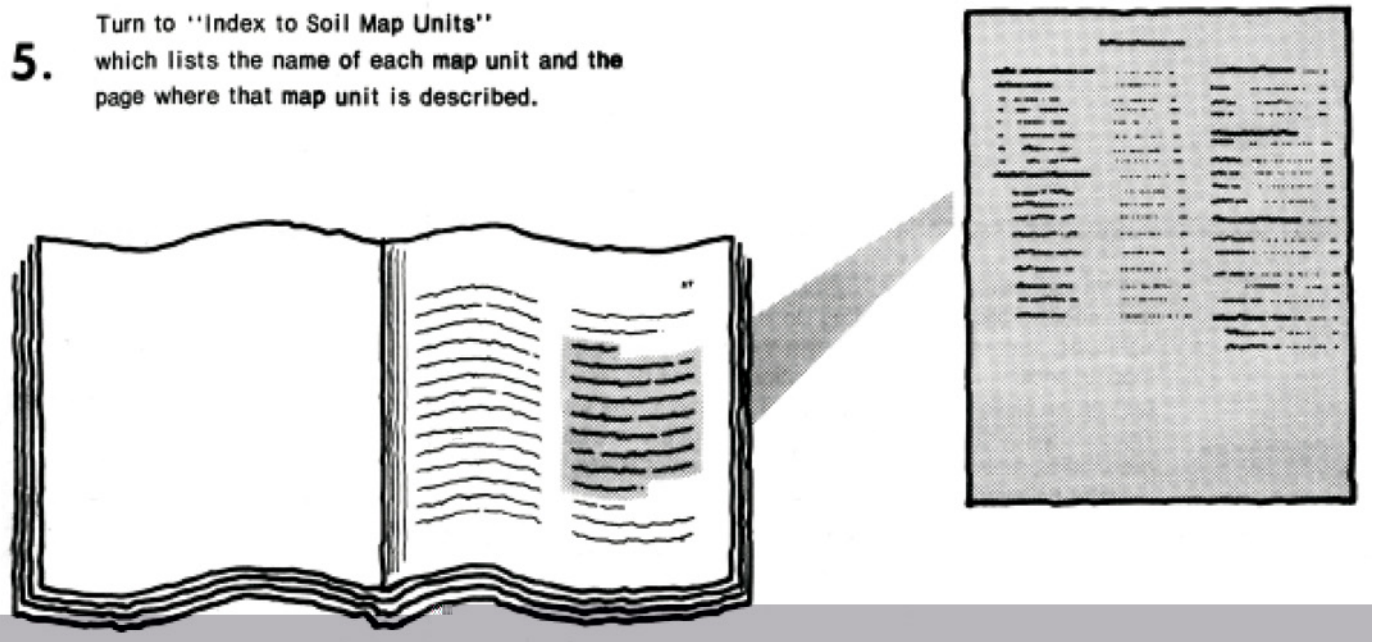
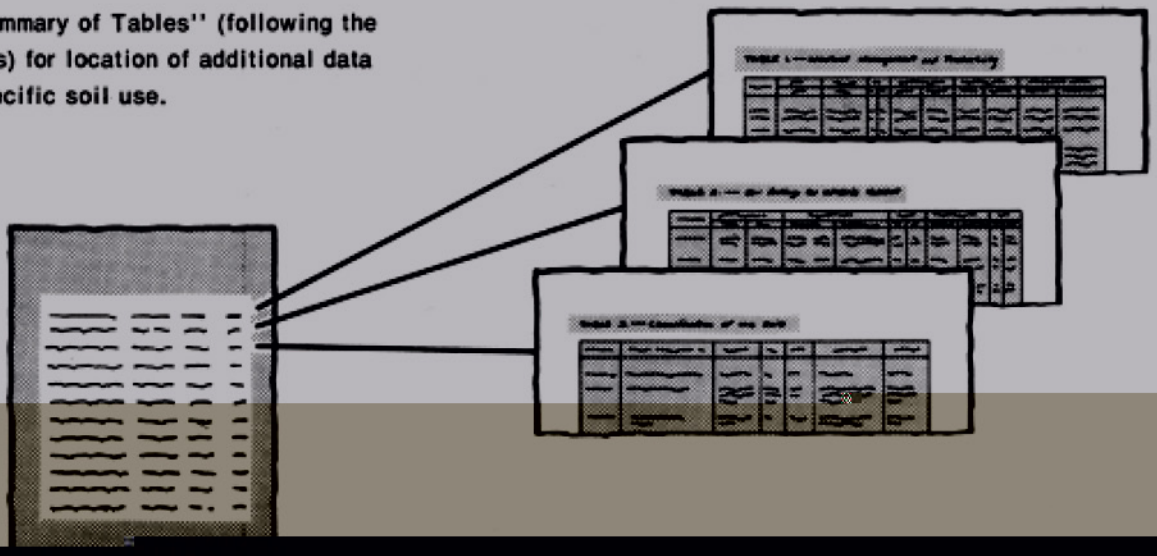
THIS SOIL SURVEY

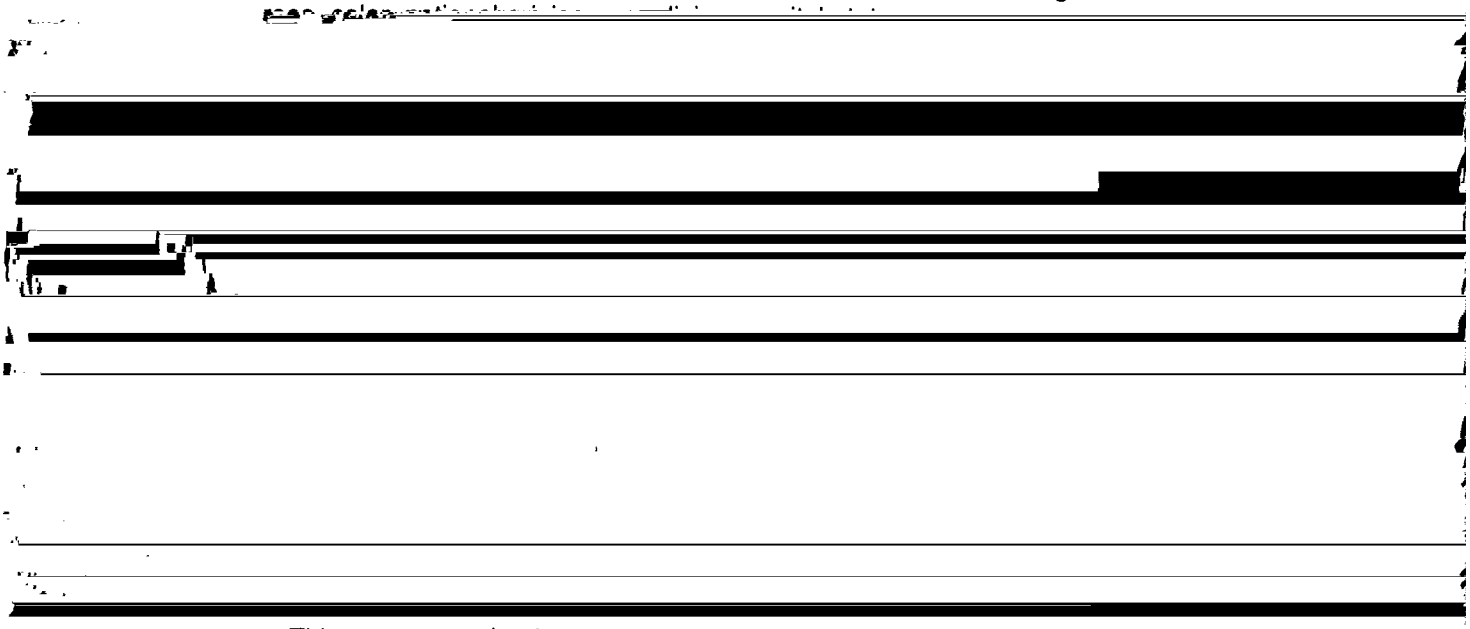
5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of



This survey was made cooperatively by the Soil Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Champaign County Soil and Water Conservation District. The cost was shared by the Champaign County Board. Major fieldwork was performed in the period 1975 to 1979. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1979.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

This soil survey is Illinois Agricultural Experiment Station Soil Report 114.

Cover: The Morrow Plots in an area of Flanagan-Urban land complex, 0 to 3 percent slopes, at the University of Illinois. Established in 1876, these are the oldest continuous experiment fields in the United States. Photo courtesy of the Agricultural Communications Department, University of Illinois.

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foreword

This soil survey contains information that can be used in land-planning programs in Champaign County, Illinois. It contains predictions of soil behavior [redacted] or hazards that adversely affect the soil, improvements needed to overcome the limitations or reduce the hazards, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal,

soil survey of
Champaign County, Illinois

By H. R. Mount, Soil Conservation Service

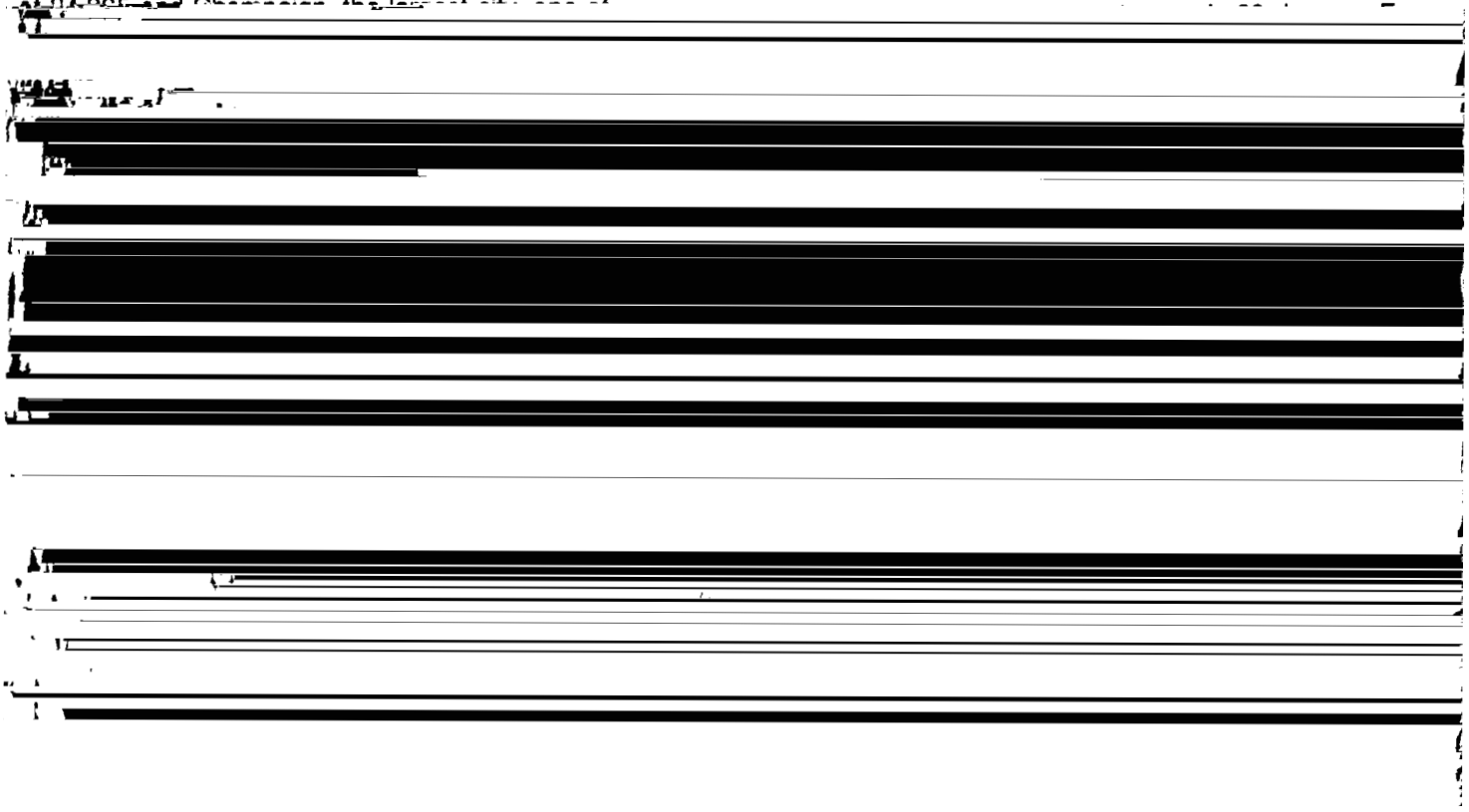
Fieldwork by H. R. Mount, C. C. Cochran, and C. E. Wacker,
Soil Conservation Service, and S. Engel, Champaign County

United States Department of Agriculture, Soil Conservation Service
in cooperation with the Illinois Agricultural Experiment Station

CHAMPAIGN COUNTY is in the east-central part of Illinois (fig. 1). It has an area of 640,000 acres, or about 1,000 square miles. It is bordered on the north by Ford County, on the east by Vermilion County, on the south by Douglas County, and on the west by Piatt and McLean Counties. In 1974, the population of the county was 165,621. Urbana, the county seat, had a population of 24,965 and Champaign, the largest city, one of

the temperature and length of growing season in the area.

Table 1 gives data on temperature and precipitation for the survey area, as recorded at Urbana, Illinois, for the period 1951 to 1973. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.



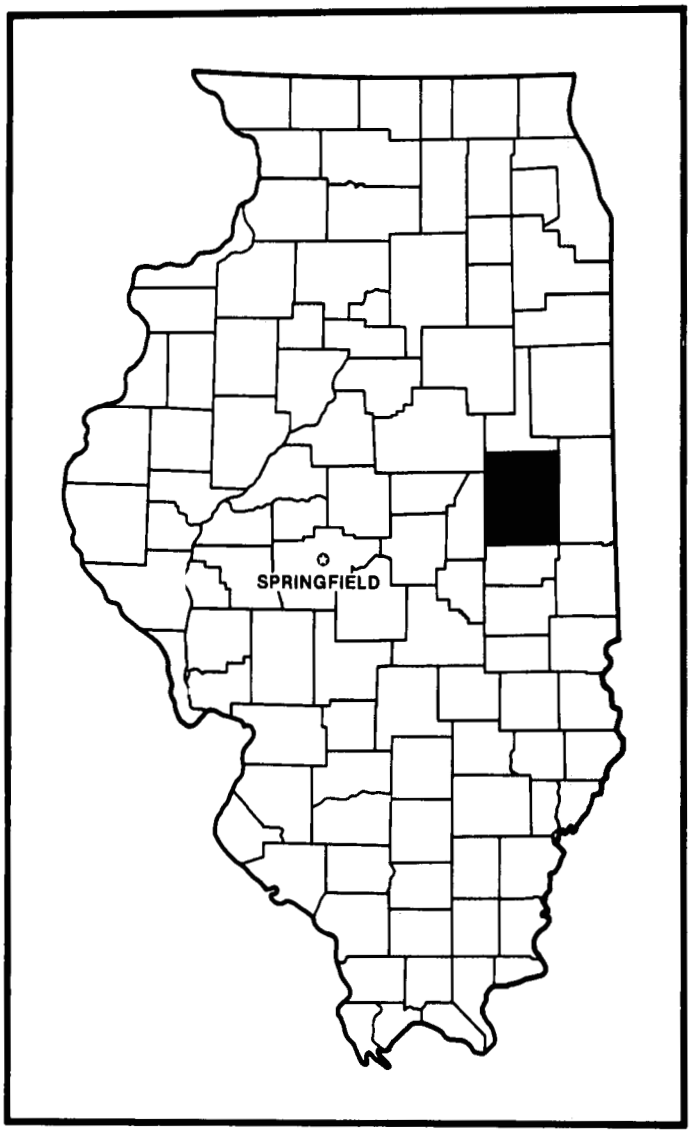


Figure 1.—Location of Champaign County in Illinois.

record was 15 inches. On the average, 13 days have at

Climatic data for this section were especially prepared for the Soil Conservation Service by the National Climatic Center, Asheville, North Carolina.

history and development

The area now known as Champaign County was annexed to the Union as a part of the Northwest Territory in 1787. It was at one time the west part of Vermilion County. On February 20, 1833, it was established as a separate county. Urbana was named as the county seat. Growth was slow until the arrival of the railroads in 1853. Since that time the county has made steady social and economic progress.

Originally, Champaign County had much wet, marshy land. Cattle raising was the primary early industry. In the late 1800's, many drainage districts were formed to drain the land by dredging ditches. This drainage system allowed for the cultivation of the level, wet areas. As a result, the major land use changed from cattle raising to grain farming.

In 1867, a land grant college, later to become the University of Illinois, was established in the Champaign-Urbana area. The university has been a major influence in the economic and cultural development of the county. About 1,900 acres of agricultural experiment fields, including the Morrow Plots, the oldest continuous experimental plots in the United States (fig. 2), are adjacent to the campus. Other educational institutions include Parkland Junior College, in Champaign, and Chanute Technical Training Center, a training facility for the United States Air Force, in Rantoul.

Diverse economic, cultural, and social institutions have been established in the county. A variety of libraries, newspapers, and radio and television stations serve local communities. The principal manufactured products are road machinery, alloy castings, sporting goods, air-conditioning equipment, bleachers, motorcycle accessories, and a variety of food and plastic products. Urban development is likely to continue in the future (fig. 3). Agriculture and agribusiness are important parts of the local economy. More than 80 percent of the acreage in the county is used for cultivated crops, primarily corn and soybeans.

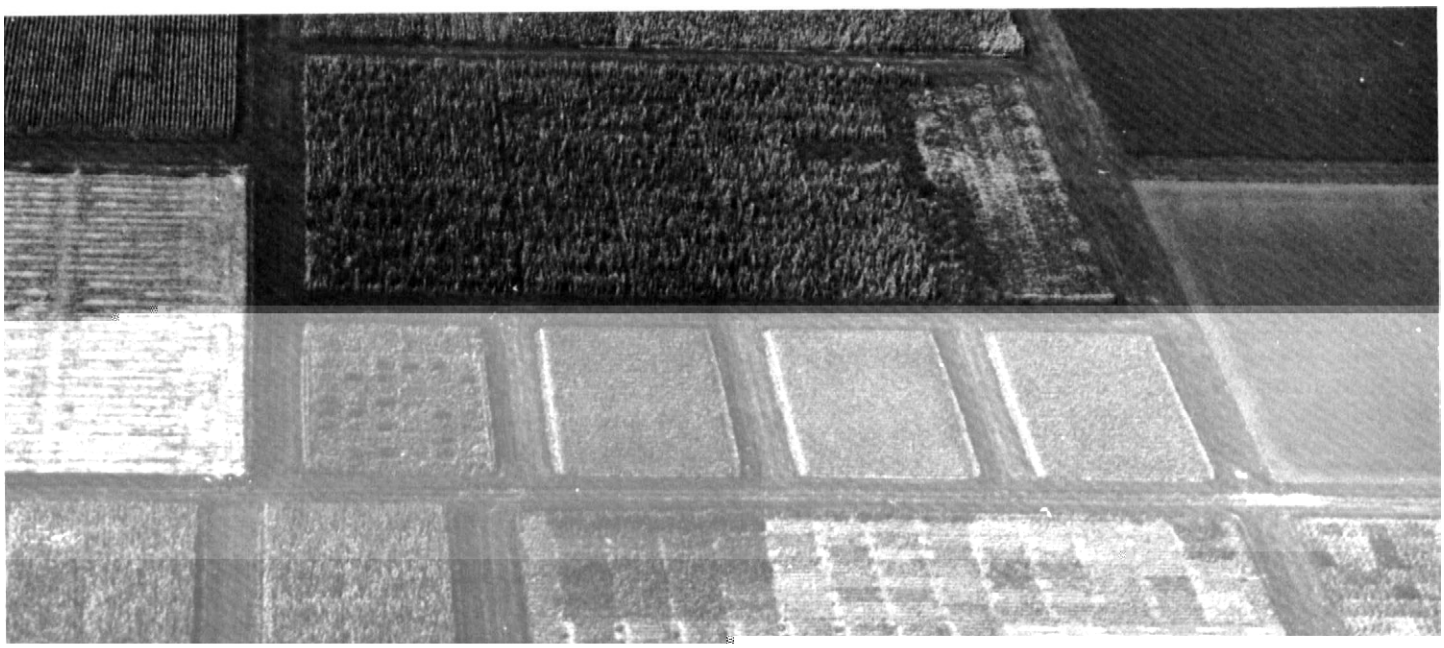


Figure 2.—Experimental plots at the University of Illinois.

of the smaller towns. A major airport south of Savoy provides commercial air service, and several smaller airports are throughout the county.

natural resources

Soil is the chief natural resource in Champaign County. An estimated 2,000 farms make up more than 80 percent of the total acreage. Corn and soybeans are the major crops. Secondary farm products include wheat,

natural lakes in the county. More than 450 acres of manmade lakes and about 120 miles of streams, however, provide fishing opportunities. Sunfish, bass, crappie, catfish, northern pike, and other fish inhabit these waters.

Subsurface natural resources in the county include water, sand and gravel, and coal. Most of the water supply is pumped from an aquifer system in the Teays Valley, a major bedrock valley in the northwestern part of the county. About 26,000 acres is underlain by sand and

Figure 3 —Urban development on Drummer and Elburn soils.

of glaciation. This glacier deposited an average of more than 200 feet of glacial drift, forming the present topography. In most areas this glacial drift was covered by as much as 5 feet of windblown silt, or loess.

The county is dissected by several gently undulating moraines separated by wide, nearly level till or outwash plains. The highest feature in the county is the Champaign Moraine, which reaches an altitude of 860 feet north of Rising. The lowest elevation, in the area where the Salt Fork leaves the county, is about 630 feet.

Six major watersheds drain the county. These are Salt Fork, Sangamon, Kaskaskia, and Embarras Rivers, the Middle Fork of the Vermilion River, and the Little Vermilion River. The watercourses drain primarily to the southeast and southwest. About 25,000 acres adjacent to drainageways is subject to temporary flooding. A drainage system is needed in the flatter areas. An estimated 165 miles of surface ditches has been established, and more than 4,300 miles of subsurface tile has been installed.

how this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles.

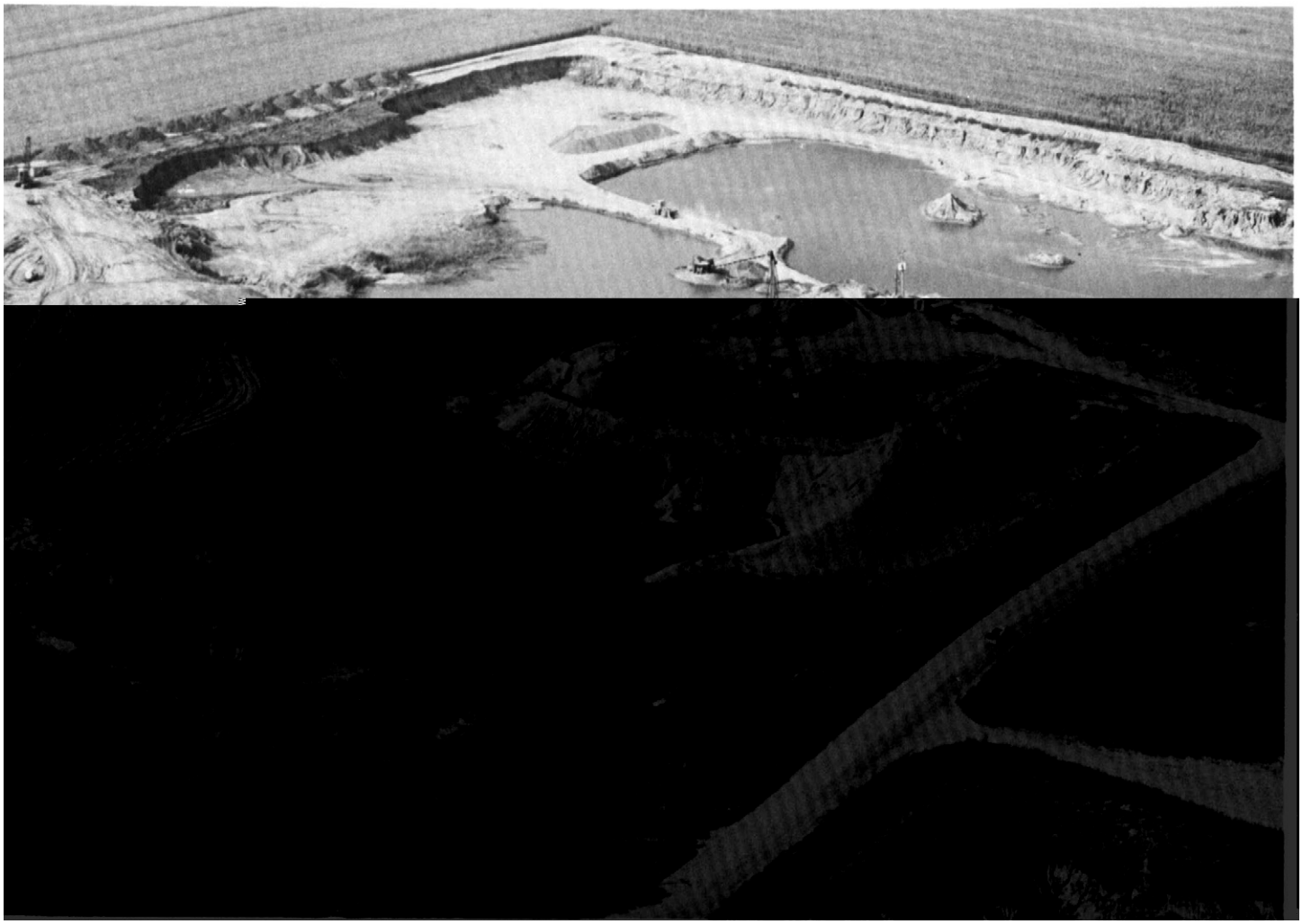


Figure 4.—Mined area of sand and gravel along the Sangamon River.

A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching

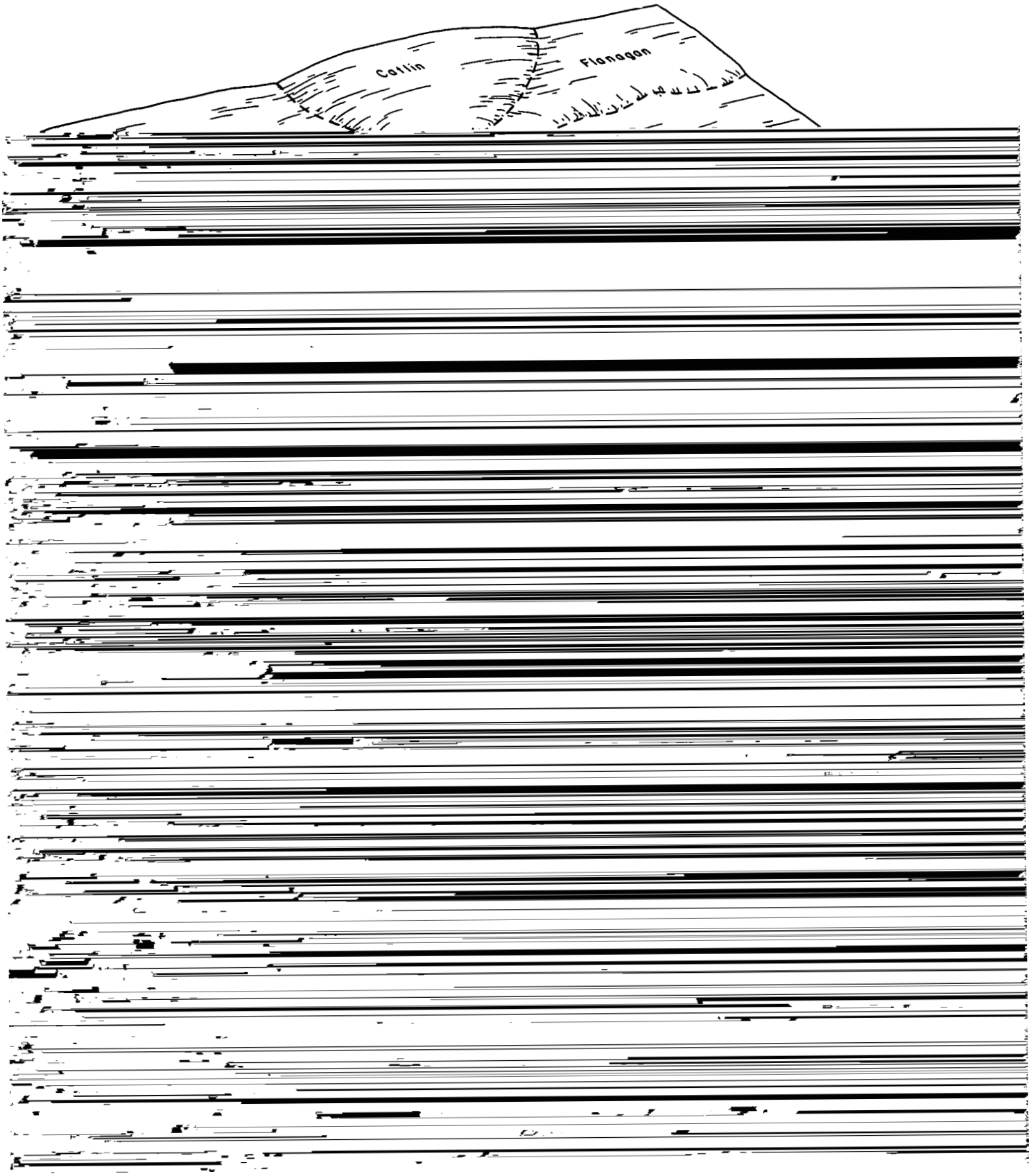
While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine

general soil map units

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically

This association makes up about 36 percent of the county. It is about 50 percent Drummer soils, 40 percent Flanagan soils, and 10 percent minor soils (fig. 5).

The poorly drained Drummer soils are in drainageways


Catlin
Flanagan

swells and the swales range from 10 to 100 feet. The soils on the swells are gently sloping and sloping. The low areas are nearly level and commonly are closely intermingled with the more sloping areas. A few isolated spots in the southeastern part of the county are strongly sloping.

This association makes up about 7 percent of the county. It is about 30 percent Dana soils, 20 percent Parr soils, 20 percent Drummer soils, and 30 percent minor soils (fig. 6).

The gently sloping, moderately well drained Dana soils either are on slopes below the Parr soils or occur as areas closely intermingled with areas of those soils. Typically, the surface soil is very dark grayish brown silt loam about 12 inches thick. The subsoil is about 38 inches thick. It is mottled. The upper part is brown and yellowish brown silty clay loam; the next part is yellowish brown clay loam; and the lower part is light olive brown loam. The underlying material to a depth of 60 inches is

about 10 inches thick. The subsoil is about 21 inches thick. The upper part is brown and light olive brown clay loam, and the lower part is light olive brown loam. The underlying material to a depth of 60 inches is light olive brown, mottled, calcareous loam.

The nearly level, poorly drained Drummer soils are in drainageways below the Parr and Dana soils. Typically, the surface soil is black silty clay loam about 14 inches thick. The subsoil is about 33 inches thick. It is mottled. The upper part is very dark gray and dark gray silty clay loam; the next part is grayish brown and yellowish brown silty clay loam; and the lower part is yellowish brown loam. The underlying material to a depth of 60 inches is dark gray, mottled, stratified loam and sandy loam.

Minor in this association are Brenton, Catlin, Flanagan, Peotone, and Raub soils. The somewhat poorly drained Brenton, Flanagan, and Raub soils are in areas below the Dana soils. The moderately well drained Catlin soils occur as areas closely intermingled with areas of the

generally are well suited to the cultivated crops commonly grown in the county. Corn, soybeans, small grain, and hay grow well. Fertility and the content of organic matter are moderate in the Parr and Dana soils and high in the Drummer soils. Available water capacity is moderate in the Parr soils and high in the Dana and Drummer soils. The main management

grain, and hay grow well. Available water capacity is high in both of the major soils. Fertility also is high. The content of organic matter is high in the Drummer soils but is moderately low in the Xenia soils. The main management needs are measures that control erosion and soil blowing, maintain the drainage system in the Drummer soils, and maintain tilth and fertility.

4. Drummer-Xenia association

Nearly level and gently sloping soils formed in loess and glacial outwash on outwash plains

These soils are on the glacial outwash plains that are

loam. The underlying material to a depth of 72 inches is mottled brownish yellow and light gray silt loam and sandy loam stratified with thin layers of loamy sand.

Minor in this association are Colo, Harpster, Jasper, La Hogue, Millbrook, Peotone, Plano, Proctor, Thorp, and Wea soils. The poorly drained Colo soils are in small areas on bottom land. The poorly drained Harpster and Thorp soils occur as areas closely intermingled with areas of the Drummer soils. Also, Harpster soils have a calcareous surface layer. The well drained Jasper soils are in areas above the Brenton and Elburn soils. The somewhat poorly drained La Hogue and Millbrook soils occur as areas closely intermingled with areas of the Brenton soils. The very poorly drained Peotone soils are in enclosed depressions. The moderately well drained Plano and Proctor soils generally are in areas above the Elburn soils. The well drained Wea soils occur as areas closely intermingled with areas of the Brenton soils. They are underlain by sand and gravel.

Most of this association is used for cultivated crops, but a few areas are used for hay and pasture. The soils are well suited to all of the cultivated crops commonly grown in the county. Corn, soybeans, small grain, and hay grow well. Fertility and the content of organic matter are high in all of the major soils. Available water capacity also is high. The main management needs are measures

6. Drummer-Kendall-St. Charles association

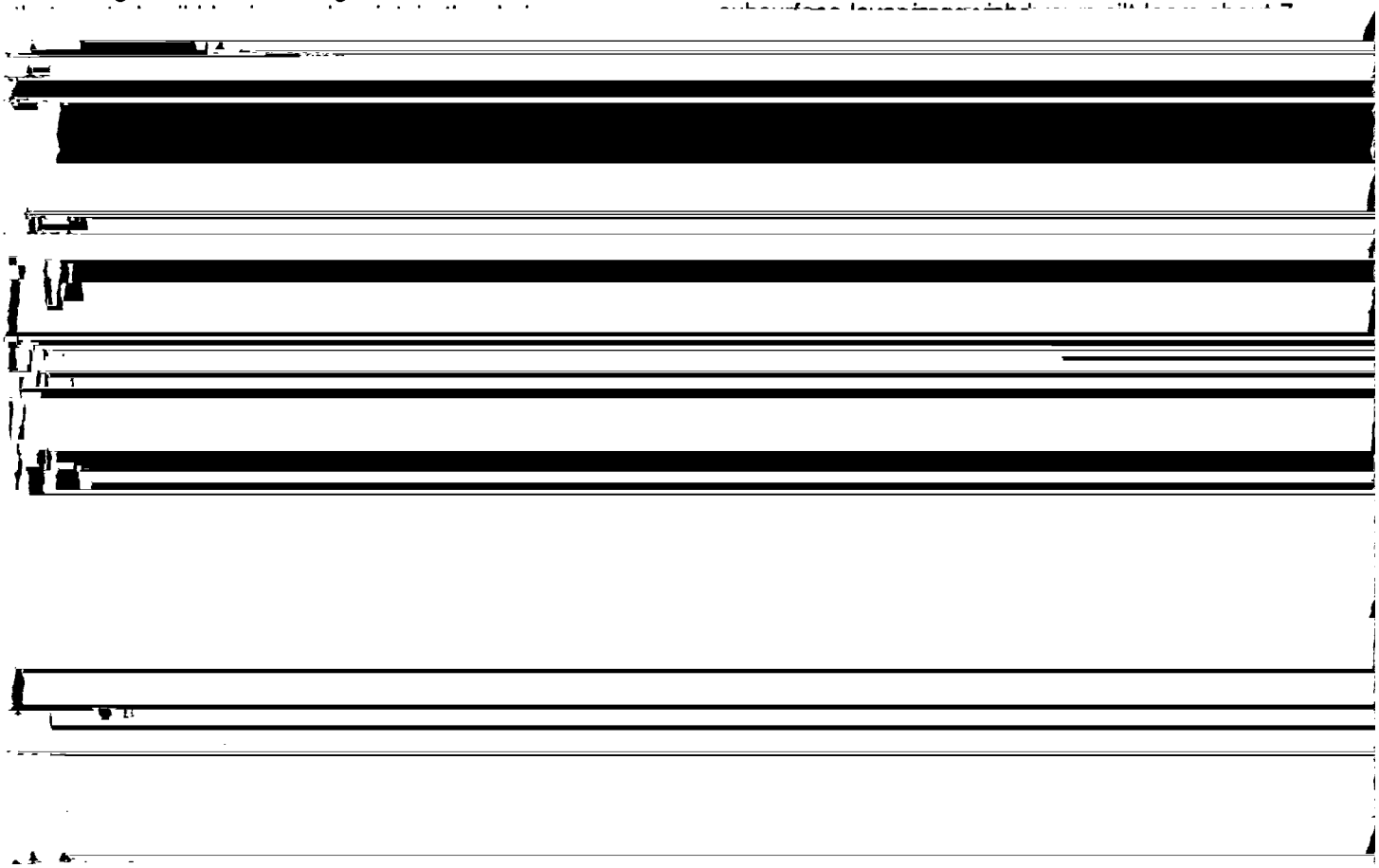
Nearly level and gently sloping, poorly drained to moderately well drained, silty soils on outwash plains

This association is on outwash plains characterized by swells and knolls and by low areas. Also evident are short, steep slopes and small areas of bottom land. The swells have slopes that are 100 to 500 feet long.

This association makes up about 1 percent of the county. It is about 30 percent Drummer soils, 15 percent Kendall soils, 15 percent St. Charles soils, and 40 percent minor soils (fig. 7).

The nearly level, poorly drained Drummer soils are in drainageways below the Kendall and St. Charles soils. Typically, the surface soil is black silty clay loam about 14 inches thick. The subsoil is about 33 inches thick. It is mottled. The upper part is very dark gray and dark gray silty clay loam; the next part is grayish brown and yellowish brown silty clay loam; and the lower part is brown loam. The underlying material to a depth of 60 inches is dark gray, mottled, stratified loam and sandy loam.

The nearly level, somewhat poorly drained Kendall soils are on slight rises above the Drummer soils and below the St. Charles soils. Typically, the surface layer is dark grayish brown silt loam about 11 inches thick. The



upper part is yellowish brown, mottled silty clay loam; the next part is mottled gray and yellowish brown silty clay loam; and the lower part is gray, mottled loam. The underlying material to a depth of 60 inches is mottled gray and strong brown, stratified silt loam, loam, and sandy loam.

The gently sloping, moderately well drained St. Charles soils are in areas above the Kendall and Drummer soils. Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsurface layer is brown silt loam about 2 inches thick. The subsoil is about 45 inches thick. The upper part is brown and dark yellowish brown silty clay loam; the next part is dark yellowish brown and yellowish brown, mottled silty clay loam and silt loam; and the lower part is yellowish brown, mottled silt loam stratified with loamy sand. The underlying material to a depth of 60 inches is yellowish brown loam.

Minor in this association are Ambraw, Camden, Colo, Martinsville, Millbrook, and Ockley soils. The poorly drained Ambraw and Colo soils are in small areas on the upper parts of bottom land. The well drained Camden, Martinsville, and Ockley soils occur as areas closely intermingled with areas of the St. Charles soils. The somewhat poorly drained Millbrook soils are on slight rises above the Drummer soils and closely intermingled with areas of the Kendall soils.

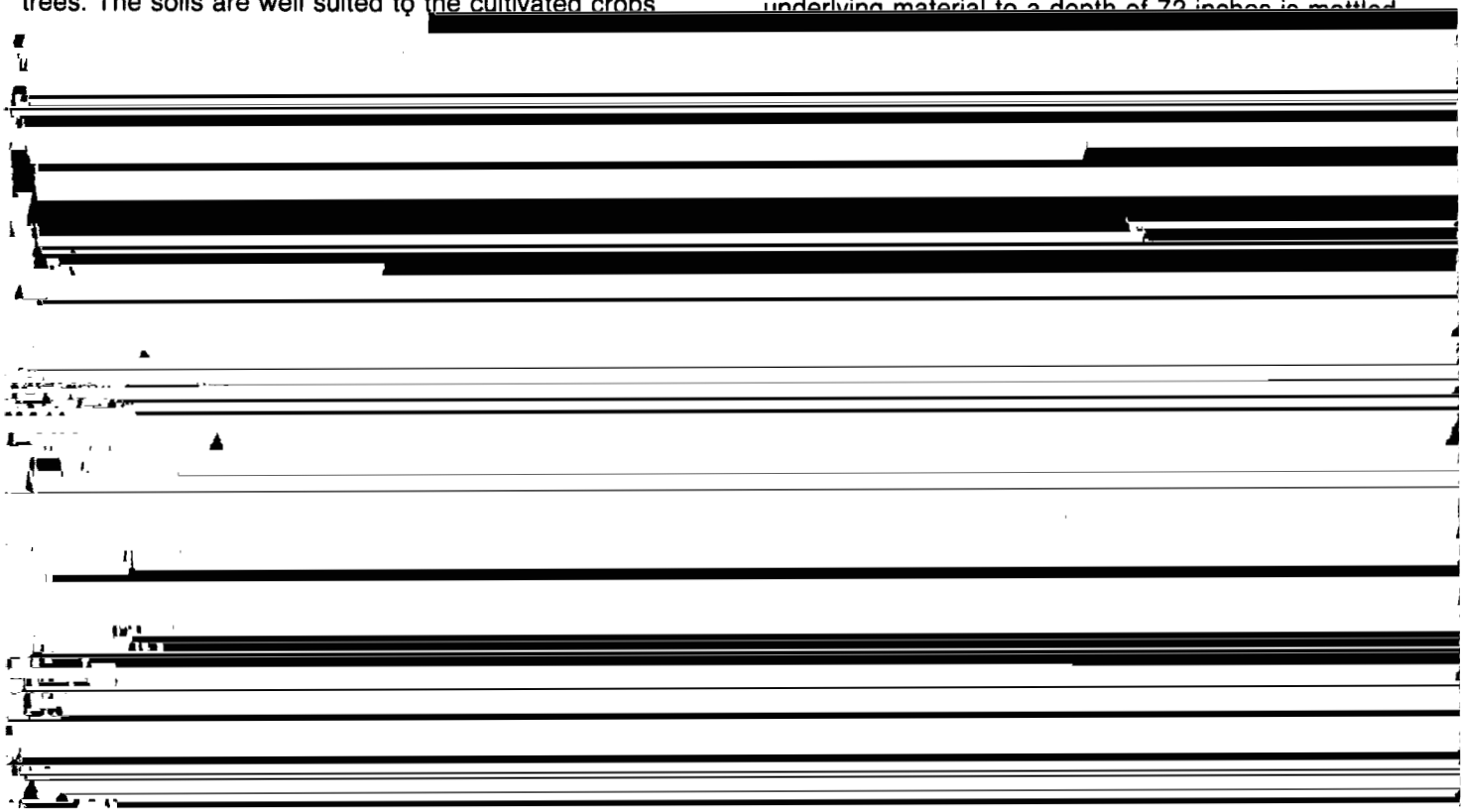
Most of this association is used for cultivated crops, but some of the acreage is used for hay, pasture, or trees. The soils are well suited to the cultivated crops

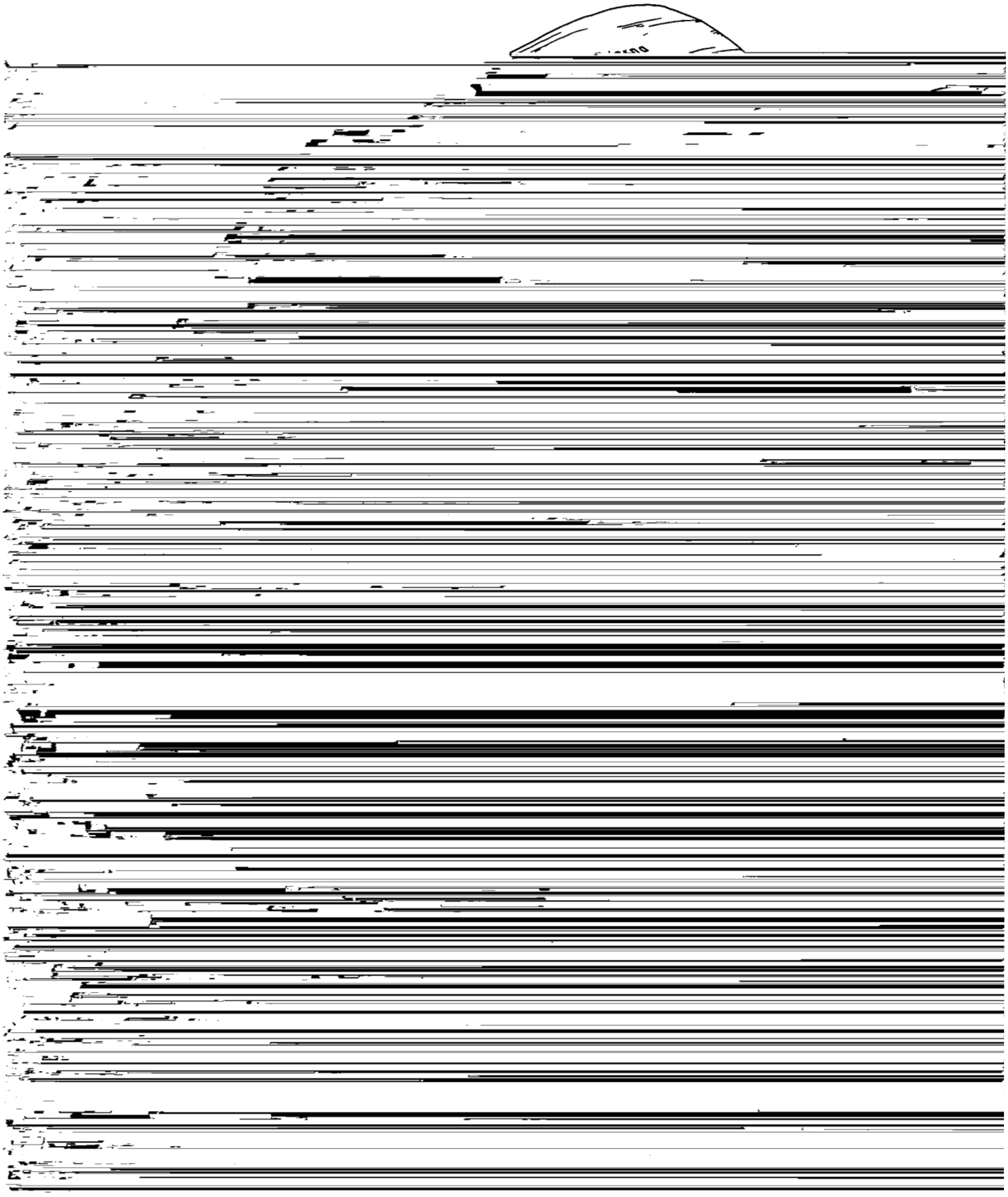
This association makes up about 6 percent of the county. It is about 30 percent Varna soils, 30 percent Elliott soils, 25 percent Ashkum soils, and 15 percent minor soils (fig. 8).

The gently sloping or sloping, moderately well drained Varna soils are on ridgetops above and side slopes below the Elliott soils. Typically, the surface layer is very dark gray silt loam about 7 inches thick. The subsurface layer is very dark gray silty clay loam about 4 inches thick. The subsoil is about 29 inches thick. The upper part is brown and olive brown silty clay, and the lower part is olive brown and olive, mottled silty clay loam. The underlying material to a depth of 60 inches is olive gray, mottled, calcareous silty clay loam.

The gently sloping, somewhat poorly drained Elliott soils are on gentle rises above the Ashkum soils and on toe slopes below the Varna soils. Typically, the surface layer is black silt loam about 12 inches thick. The subsoil is about 29 inches thick. It is light olive brown and mottled. The upper part is silty clay, and the lower part is silty clay loam. The underlying material to a depth of 60 inches is mottled gray and light olive brown, calcareous silty clay loam.

The nearly level, poorly drained Ashkum soils are in drainageways below the Varna and Elliott soils. Typically, the surface soil is black silty clay loam about 17 inches thick. The subsoil is about 39 inches thick. It is mottled. The upper part is dark grayish brown and dark gray silty clay, and the lower part is gray silty clay loam. The underlying material to a depth of 72 inches is mottled





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swells and by low areas. Relief in this association is 5 feet or less.

This association makes up about 1 percent of the county. It is about 70 percent Colo soils, 20 percent Ross soils, and 10 percent minor soils.

The poorly drained Colo soils are in areas below the Ross soils. Typically, the surface layer is very dark gray silty clay loam about 9 inches thick. The subsurface layer is black and very dark gray, mottled silty clay loam about 29 inches thick. The subsoil is very dark gray, mottled silty clay loam about 12 inches thick. The underlying material to a depth of 68 inches is mottled dark grayish brown and gray clay loam.

soils in these associations. The soils in association 11 are commonly flooded, mainly in winter and early in spring. The floodwater causes slight to moderate crop damage. Wetness is the major limitation affecting the use of this association for crops. Colo and Ross soils are the major soils in this association, and Ambraw soils are the most extensive minor soils.

A small acreage in the county is pastured. All associations are suitable for grasses and legumes. The dominant soils throughout the associations are Drummer, Flanagan, Parr, Dana, Raub, Elburn, Elliott, Ashkum, and Varna soils on uplands and Colo, Ambraw, and Ross soils on flood plains.

detailed soil map units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and management of the soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and identifies the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Miami silt loam, 2 to 5 percent slopes, is one of several phases in the Miami dissimiliar soils are described in each map unit. Also, some of the more unusual or strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes some *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example. Some miscellaneous areas are large enough to be delineated on the soil maps. Some that are too small to be delineated are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

soil descriptions

23A—Blount silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is in plane and concave areas on till plains. Individual areas are irregular in shape and range from 2 to 200 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is grayish brown, friable silt loam about 3 inches thick. The subsoil is about 29 inches thick. The upper part is brown, mottled, firm silty clay loam; the next part is grayish brown, mottled, firm silty clay; and the lower part is mottled yellowish brown and gray, firm silty clay. The underlying material to a depth of 60 inches is yellowish brown, mottled, calcareous silty clay loam. In

mildly alkaline in the subsoil and varies in the surface layer as a result of local liming practices. The surface layer tends to crust after spring and summer rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to pasture and hay and to habitat for woodland and openland wildlife and is moderately well suited to cultivated crops. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

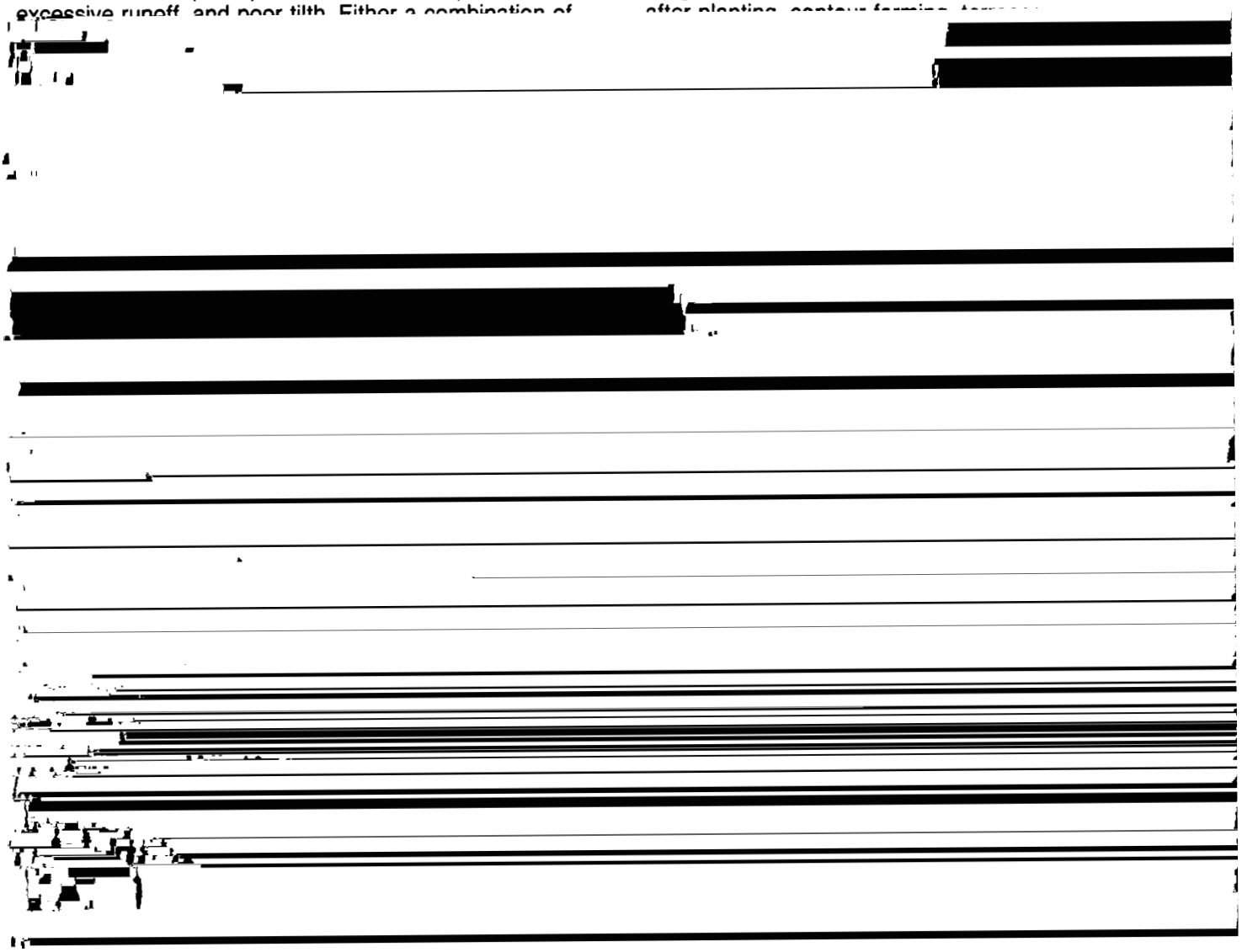
Because a drainage system has been installed, this soil is sufficiently drained for corn, soybeans, and small grain. Surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

The plants grazed by livestock or harvested for hay grow well on this soil. Deferment of grazing when the soil is too wet helps to prevent surface compaction, excessive runoff, and poor tilth. Either a combination of

3.0 feet below the surface during the spring. Available water capacity is moderate. Organic matter content also is moderate. Reaction ranges from very strongly acid to mildly alkaline in the subsoil and varies in the surface layer as a result of local liming practices. The surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are used for pasture or hay, but a large acreage is used for cultivated crops or for trees. This soil is well suited to pasture and hay and to openland wildlife habitat and is moderately well suited to cultivated crops. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

Because a drainage system has been installed, this soil is sufficiently drained for corn, soybeans, and small grain. If cultivated crops are grown, erosion is the main hazard and wetness the main limitation. A conservation tillage system that leaves crop residue on the surface after planting, contour farming, terrace



layer is darker. In places the depth to the underlying material is more than 40 inches.

Included with this soil in mapping are small areas of the poorly drained Drummer soils and the somewhat poorly drained Sabina soils. These soils are in shallow depressions and drainageways below the Miami soil. They make up 2 to 8 percent of the unit.

Water and air move through the subsoil of the Miami soil at a moderate rate and through the underlying material at a moderately slow rate. Surface runoff is medium in cultivated areas. Reaction is medium acid in the upper part of the subsoil and mildly alkaline in the lower part. It varies in the surface layer as a result of local liming practices. Available water capacity is high. Organic matter content is moderately low. In cultivated areas the surface layer tends to crust after hard rains. The potential for frost action and the shrink-swell potential are moderate.

Most areas are cultivated. This soil is well suited to cultivated crops and to pasture and hay, habitat for woodland and openland wildlife, and lawns and landscaping. It is moderately well suited to dwellings, septic tank absorption fields, and local roads and streets.

brown and light yellowish brown, calcareous loam. In some areas the subsoil is exposed. In other areas the content of sand in the subsoil is less than 15 percent. In places the depth to the underlying material is greater.

Included with this soil in mapping are small areas of the poorly drained Drummer soils. These soils are in shallow depressions and drainageways below the Miami soil. They make up 1 to 5 percent of the unit.

Water and air move through the subsoil of the Miami soil at a moderate rate and through the underlying material at a moderately slow rate. Surface runoff is medium in cultivated areas. Available water capacity is moderate. Organic matter content is moderately low. Reaction is medium acid in the upper part of the subsoil and mildly alkaline in the lower part. It varies in the surface layer as a result of local liming practices. In cultivated areas the surface layer tends to crust after hard rains. The potential for frost action and the shrink-swell potential are moderate.

Most areas are used for pasture or hay. This soil is well suited to cultivated crops and to pasture and hay, habitat for openland and woodland wildlife, and lawns and landscaping. It is moderately well suited to

Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is grayish brown, friable silt loam about 2 inches thick. The subsoil is about 20 inches thick. The upper part is yellowish brown and brown, firm clay loam, and the lower part is brown, friable loam. The underlying material to a depth of 60 inches is light olive brown and light yellowish brown, calcareous loam. In some areas, the subsoil is thinner and the underlying material contains more clay and less sand. In other areas the underlying material is stratified, loamy outwash.

Included with this soil in mapping are small areas of the poorly drained Ambraw and Colo soils. These soils are on alluvial bottom land below the Miami soil. They make up 1 to 5 percent of the unit.

Water and air move through the subsoil of the Miami soil at a moderate rate and through the underlying material at a moderately slow rate. Surface runoff is rapid in cultivated areas. Available water capacity is

Typically, the surface layer is dark yellowish brown, friable silt loam about 7 inches thick. The subsurface layer is grayish brown, friable silt loam about 2 inches thick. The subsoil is about 16 inches thick. The upper part is yellowish brown and brown, firm clay loam, and the lower part is light olive brown, friable loam. The underlying material to a depth of 60 inches is light olive brown, calcareous loam. In some areas, the subsoil is thinner and the underlying material contains more clay. In other areas the underlying material is stratified, loamy outwash.

Included with this soil in mapping are small areas of the poorly drained Ambraw and Colo soils. These soils are on alluvial bottom land below the Miami soil. They make up 1 to 7 percent of the unit.

Water and air move through the subsoil of the Miami soil at a moderate rate and through the underlying material at a moderately slow rate. Surface runoff is rapid in pastured areas. Available water capacity is

areas are irregular in shape and range from 4 to 100 acres in size.

Typically, the surface soil is very dark grayish brown, friable silt loam about 12 inches thick. The subsoil is about 38 inches thick. It is friable and mottled. The upper part is brown and yellowish brown silty clay loam; the next part is yellowish brown clay loam; and the lower part is light olive brown loam. The underlying material to a depth of 60 inches is light olive brown, mottled, calcareous loam. In places the surface soil is thinner or lighter in color. In some areas, the upper part of the subsoil contains more sand and carbonates are closer to the surface. In other areas stratified, loamy outwash is mixed with the loam till in the underlying material.

Included with this soil in mapping are small areas of the poorly drained Drummer soils and the somewhat poorly drained Flanagan and Raub soils. These soils are

in winter and early in spring. Individual areas are linear or horseshoe shaped and range from 2 to 80 acres in size.

Typically, the surface layer is black, friable, calcareous silty clay loam about 11 inches thick. The subsoil is about 30 inches thick. It is calcareous, friable, and mottled. The upper part is dark gray and gray silty clay loam, and the lower part is gray silt loam. The underlying material to a depth of 60 inches is mottled gray and yellowish brown, calcareous, stratified loam and silt loam. In some areas the surface layer does not have carbonates. In other areas the subsoil contains more sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton, Elburn, and Flanagan soils. These soils are on slight rises above the Harpster soil. They make up 1 to 8 percent of the unit.

Water and air move through the Harpster soil at a

periods from March to June. Individual areas are irregular [redacted] other areas they are [redacted]

outwash plains. Individual areas are irregular in shape and range from 2 to 150 acres in size.

Typically, the surface soil is black and very dark brown, friable loam about 16 inches thick. It is brown, mottled, and friable. The upper part is clay loam and sandy clay loam, and the lower part is sandy loam. The underlying material to a depth of 65 inches is mottled grayish brown, strong brown, gray, light olive gray, and brownish yellow, stratified sandy loam and silt loam. In places the surface soil is thinner and lighter in color. In some areas the lower part of the subsoil formed in calcareous loam glacial till. In other areas the upper part of the subsoil contains less sand.

Included with this soil in mapping are small areas of the poorly drained Drummer soils, the well drained Jasper soils, and the moderately well drained Proctor soils. Drummer soils are in shallow depressions and drainageways below the La Hogue soil. Jasper and Proctor soils are on side slopes and ridgetops above the La Hogue soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the La Hogue soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1.0 to 3.0 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderate. Reaction ranges from medium acid to mildly alkaline in the subsoil and varies in the surface layer as a result of the local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high.

in spring. Individual areas are irregular in shape and range from 2 to 500 acres in size.

Typically, the surface soil is black, friable loam about 13 inches thick. The subsoil is about 33 inches thick. It is friable and mottled. The upper part is dark gray loam, and the lower part is gray loam and sandy loam. The underlying material to a depth of 73 inches is mottled gray and yellowish brown, stratified sandy loam, loamy sand, and silt loam. In some areas the surface soil and subsoil contain less sand and more silt. In a few areas the underlying material is calcareous silty clay loam or loam till.

Included with this soil in mapping are small areas of the well drained Jasper soils and the somewhat poorly drained Brenton and La Hogue soils. These soils are on slight rises and knobs above the Selma soil. They make up 2 to 5 percent of the unit.

Water and air move through the subsoil of the Selma soil at a moderate rate and through the underlying material at a moderately rapid rate. Surface runoff is very slow or ponded in cultivated areas. A seasonal high water table ranges from 0.5 foot above the surface to 2.0 feet below during the spring. Available water capacity is high. Organic matter content also is high. Reaction ranges from slightly acid to mildly alkaline in the subsoil and varies in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to habitat for openland wildlife and

and stream terraces. Individual areas are irregular in shape and range from 5 to 25 acres in size.

Typically, the surface layer is dark grayish brown, very friable sandy loam about 8 inches thick. The subsurface layer is brown and yellowish brown, very friable and friable sandy loam about 12 inches thick. The subsoil extends to a depth of 66 inches. The upper part is yellowish brown, friable sandy loam and loam, and the lower part is brown, friable, stratified loamy sand, sandy loam, and sandy clay loam. In some areas the surface layer is darker. In other areas the subsoil contains more clay and less sand.

Included with this soil in mapping are small areas of the poorly drained Colo soils and the somewhat poorly drained La Hogue soils. Colo soils are on bottom land

134B—Camden silt loam, 1 to 5 percent slopes. This gently sloping, well drained soil is in convex areas on outwash plains and stream terraces. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is dark grayish brown, friable silt loam about 5 inches thick. The subsoil is about 48 inches thick. It is friable. The upper part is yellowish brown silt loam and silty clay loam, and the lower part is brown and yellowish brown loam and sandy loam. The underlying material to a depth of 77 inches is yellowish brown, stratified sandy loam, loam, and sandy clay loam. In places the surface soil is darker. In some areas the underlying material is calcareous loam. In other areas the upper part of the

areas are irregular in shape and range from 2 to 300 acres in size.

Typically, the surface layer is black, friable silt loam about 12 inches thick. The subsoil is about 29 inches thick. It is firm, light olive brown, and mottled. The upper part is silty clay, and the lower part is silty clay loam. The underlying material to a depth of 60 inches is mottled gray and light olive brown, calcareous silty clay loam. In places the surface layer is thinner and contains subsoil material. In some areas, the subsoil is thicker and the depth to calcareous silty clay loam till is greater. In other areas the lower part of the subsoil is friable loam or sandy loam.

Included with this soil in mapping are small areas of the poorly drained Ashkum soils and the moderately well drained Varna soils. Ashkum soils are in depressions and drainageways below the Elliott soil, and Varna soils are

knolls, and short, uneven side slopes on outwash plains

shape and range from 5 to 100 acres in size.

Typically, the surface soil is very dark brown and very dark grayish brown, friable silt loam about 14 inches thick. The subsoil is about 36 inches thick. The upper part is brown, firm silty clay loam; the next part is brown, mottled, firm clay loam; and the lower part is light olive brown and olive brown, mottled, friable, stratified loam and sandy loam. The underlying material to a depth of 66 inches is dark yellowish brown and yellowish brown, stratified loam and sandy loam. In places the surface soil is thinner and lighter in color. In some areas part of the underlying material is calcareous loam or silty clay loam till. In other areas the subsoil contains more sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Brenton and Elburn soils

about 37 inches thick. It is brown and dark yellowish brown, mottled, and friable. The upper part is silty clay loam, and the lower part is clay loam. The underlying material to a depth of 72 inches is mottled brownish yellow and light gray, stratified silt loam and sandy loam In some areas the surface soil is thinner and lighter in color. In other areas, the upper part of the subsoil contains more sand and the underlying layers formed in gravel.

Included with this soil in mapping are small areas of the poorly drained Drummer soils and the moderately well drained Proctor soils. Drummer soils are in shallow depressions and drainageways below the Brenton soil, and Proctor soils are on slopes above the Brenton soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Brenton soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1.0 to 3.0 feet below the surface during the spring. Available water capacity is

and less sand. In other areas the lower part of the subsoil has gray mottles. In a few places the content of clay is less than 15 percent in the subsoil.

Included with this soil in mapping are small areas of the poorly drained Drummer and Selma soils, the somewhat poorly drained La Hogue soils, and the moderately well drained Proctor soils. Drummer, La Hogue, and Selma soils are in shallow depressions and drainageways below the Onarga soil, and Proctor soils are in positions on the landscape similar to those of the Onarga soil. Included soils make up 5 to 10 percent of the unit.

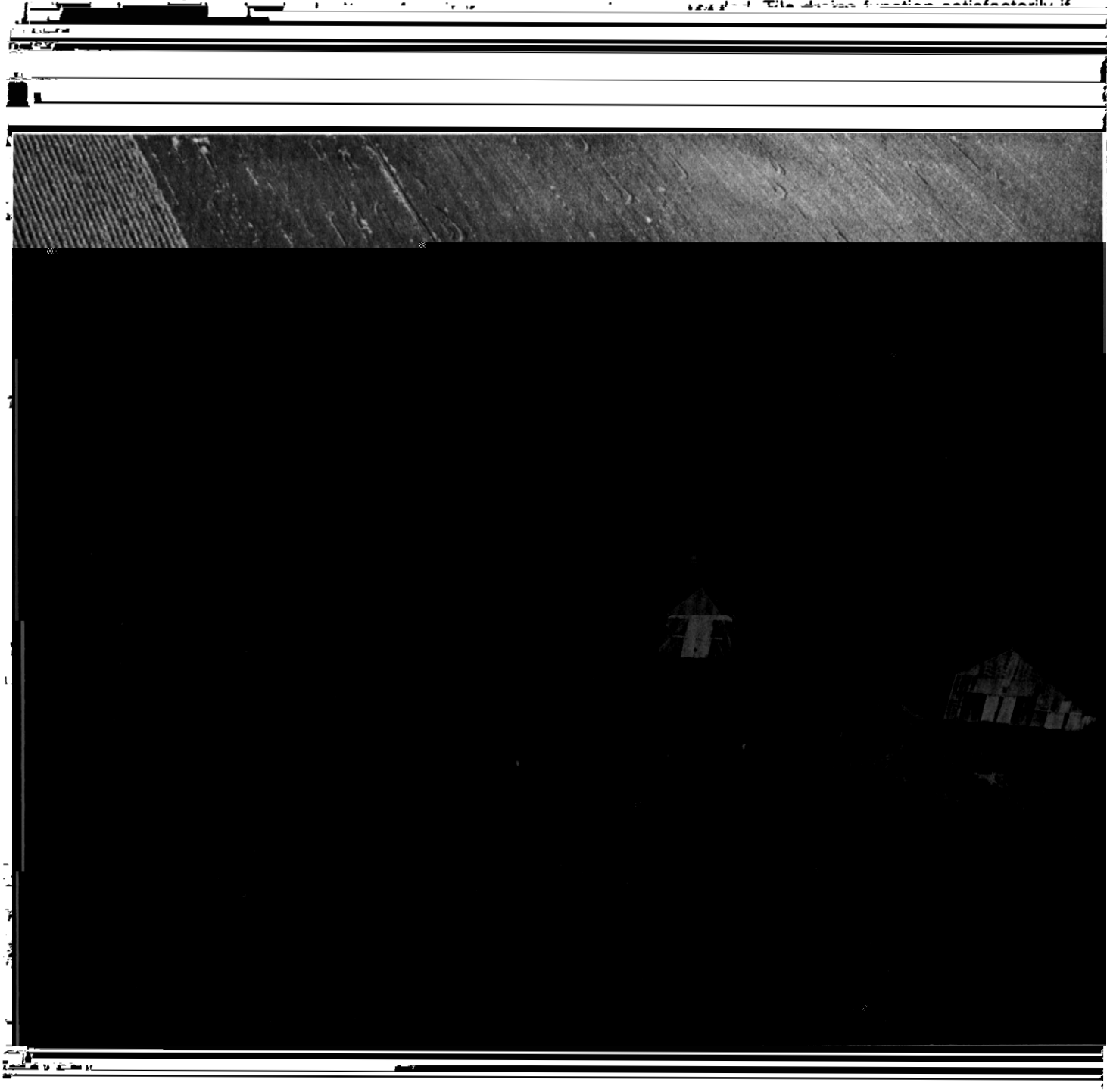
Water and air move through the subsoil of the Onarga soil at a moderately rapid rate and through the underlying material at a rapid rate. Surface runoff is medium in cultivated areas. Available water capacity is moderate. Organic matter content also is moderate. Reaction ranges from medium acid to neutral in the subsoil and varies in the surface layer as a result of local

above the Drummer soil. They make up 2 to 8 percent of the unit.

Water and air move through the Drummer soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table ranges from 0.5 feet above the surface to 2.0 feet below during the spring. Available water capacity is high. Organic matter content also is high. Reaction ranges from medium acid to moderately

Most areas are cultivated. This soil is well suited to cultivated crops and to openland wildlife habitat and is moderately well suited to pasture and hay. It is poorly suited to dwellings, lawns and landscaping, local roads and streets, and septic tank absorption fields.

Because a drainage system has been installed, this soil is sufficiently drained for corn, soybeans, and small grain (fig. 9). Measures that maintain the drainage



If this soil is used as a site for dwellings, the ponding is a hazard. Also, the shrink-swell potential is a limitation on sites for dwellings without basements. Lowering the water table with underground drains and installing surface drains help to control the ponding. Reinforcing foundations helps to prevent the structural damage caused by shrinking and swelling. Installing a drainage system helps to establish lawns and ornamental trees and shrubs.

If this soil is used as a septic tank absorption field, a drainage system is needed. Also, providing as much as 2 feet of loamy fill material is beneficial because it increases the depth to the seasonal high water table.

Low strength, ponding, the potential for frost action, and shrinking and swelling are limitations if this soil is used as a site for local roads and streets. Providing suitable subgrade material helps to prevent the damage resulting from low strength and from shrinking and swelling. Installing a drainage system and then grading the roads so that they shed water help to prevent the damage caused by ponding and frost action.

The capability subclass is IIw.

153—Pella silty clay loam. This nearly level, poorly drained soil is on upland flats and in depressions in outwash plains and till plains. It is occasionally ponded for brief periods in winter and early in spring. Individual areas are irregular in shape and range from 2 to 100 acres in size.

Typically, the surface soil is black and very dark gray, friable and firm silty clay loam about 15 inches thick. The subsoil is about 19 inches thick. The upper part is light brownish gray, mottled, firm silty clay loam, and the lower part is light brownish gray, mottled, friable, calcareous silt loam. The underlying material to a depth of 60 inches is gray, mottled, calcareous, stratified silt loam and loamy sand. In some areas the depth to the

Most areas are cultivated. This soil is well suited to cultivated crops and to openland wildlife habitat and is moderately well suited to pasture and hay. It is poorly suited to dwellings, lawns and landscaping, local roads and streets, and septic tank absorption fields.

Because a drainage system has been installed, this soil is sufficiently drained for corn, soybeans, and small grain. Measures that maintain the drainage system are needed. Tile drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used as a site for dwellings, the ponding is a hazard. It can be controlled, however, by lowering the water table with underground drains and by installing surface drains. The shrink-swell potential is a limitation on sites for dwellings without basements. Reinforcing the foundations, however, helps to prevent the structural damage caused by shrinking and swelling. Installing a drainage system helps to establish lawns and ornamental trees and shrubs.

If this soil is used as a septic tank absorption field, surface and subsurface drains are needed. Also, providing as much as 2 feet of loamy fill material is beneficial because it increases the depth to the seasonal high water table.

The capability subclass is IIw.

154A—Flanagan silt loam, 0 to 3 percent slopes. This nearly level, somewhat poorly drained soil is on slight rises on till plains and on toe slopes on moraines. Individual areas are irregular in shape and range from 2 to more than 500 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 8 inches thick. The subsurface layer is very dark brown and very dark grayish brown, friable silt loam about 10 inches thick. The subsoil is about 31 inches

areas. A seasonal high water table is 1.0 to 3.0 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. Reaction ranges from medium acid to mildly alkaline in the subsoil and varies in the surface soil as a result of local liming practices. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is moderately well suited to lawns and landscaping and is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

poorly drained Elburn and Flanagan soils. These soils are in drainageways and on slopes below the Catlin soil. They make up 2 to 10 percent of the unit.

Water and air move through the Catlin soil at a moderate rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 3.5 to 6.0 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderate. Reaction ranges from medium acid to neutral in the subsoil and varies in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high.

depressions and drainageways below the Morley soil. They make up 2 to 8 percent of the unit.

about 28 inches thick. It is firm. The upper part is

If this soil is used as a septic tank absorption field, the seasonal high water table, the slow or moderately slow permeability, and the slope are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the slow absorption of liquid waste. Installing the filter lines on the contour helps to overcome the slope.

seasonal high water table is a limitation on sites for dwellings with basements. It can be lowered, however, by installing tile drains at the base of foundations. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Cutting and filling help to overcome the slope.

If this soil is used as a septic tank absorption field, the

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Also, the shrink-swell potential is a limitation on sites for dwellings without basements. Installing drainage tile around foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Installing a drainage system helps to establish lawns and ornamental trees and shrubs.

If this soil is used as a septic tank absorption field, the seasonal high water table is a limitation. It can be lowered, however, by underground drains.

The capability class is I.

199B—Plano silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on upland ridges and short, uneven side slopes on outwash plains and stream terraces. Individual areas are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface soil is very dark grayish brown and dark brown, friable silt loam about 16 inches thick. The subsoil is about 46 inches thick. It is friable. The upper part is brown and yellowish brown silty clay loam; the next part is yellowish brown, mottled silty clay loam; and the lower part is yellowish brown, mottled, stratified silt loam and loam. The underlying material to a depth of 70 inches is light olive brown, mottled, stratified silt loam, loam, and sandy loam. In places the surface soil is thinner and lighter in color. In some areas part of the underlying material is calcareous loam or silty clay loam till. In other areas the upper part of the subsoil contains more sand.

Included with this soil in mapping are small areas of the poorly drained Drummer soils and the somewhat poorly drained Elburn soils. These soils are in shallow depressions and drainageways below the Plano soil. They make up 3 to 12 percent of the unit.

Water and air move through the Plano soil at a moderate rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 3.0 to 6.0 feet below the surface during the spring. Available water capacity is high. Organic matter content also is high. Reaction is slightly acid or medium acid in the subsoil and varies in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to pasture and hay, openland wildlife habitat, and lawns and landscaping. It is moderately well suited to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, terraces, or a combination of these.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Also, the seasonal high water table is a limitation on sites for dwellings with basements. It can be lowered, however, by installing drainage tile around the base of foundations. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If this soil is used as a septic tank absorption field, the seasonal high water table is a limitation. The septic system functions properly only if the water table is lowered or the distribution lines are installed closer to the surface than is typical.

The capability subclass is IIe.

206—Thorp silt loam. This nearly level, poorly drained soil is in shallow depressions in outwash plains and till plains. It is occasionally flooded or ponded for brief periods from March to June. Individual areas are round or oblong and range from 2 to 300 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 11 inches thick. The subsurface layer is grayish brown, friable silt loam about 6 inches thick. The subsoil is about 47 inches thick. The upper part is grayish brown, mottled, friable silty clay loam; the next part is gray, mottled, firm silty clay loam; and the lower part is mottled gray and light gray, friable, stratified loam and silt loam. In some areas the surface layer is thinner. In other areas it is silty clay loam and is not underlain by a subsurface layer.

Included with this soil in mapping are small areas of the somewhat poorly drained Flanagan soils and the well drained Wea soils. These soils are on slight rises above the Thorp soil. They make up 1 to 5 percent of the unit.

Water and air move through the subsoil of the Thorp soil at a slow rate. Surface runoff is slow to ponded in cultivated areas. A seasonal high water table ranges from 0.5 foot above the surface to 2.0 feet below during the spring. Available water capacity is very high. Organic matter content is moderate. The surface layer is cloddy if it has been plowed when too wet. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to openland wildlife habitat and is moderately well suited to pasture and hay. Because it is subject to flooding and ponding, it is poorly suited to local roads and streets and is generally unsuited to dwellings and septic tank absorption fields.

Because a drainage system has been installed, this soil is sufficiently drained for corn, soybeans, and small grain. Measures that maintain the drainage system are needed. Tile drains and surface drains generally function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

If this soil is used for pasture or hay, harvesting or grazing during wet periods and overgrazing reduce

forage production and cause surface compaction and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The capability subclass is IIw.

219—Millbrook silt loam. This nearly level, somewhat poorly drained soil is on broad outwash plains. Individual areas are irregular in shape and range from 2 to 50 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is dark grayish brown, friable silt loam about 7 inches thick. The subsoil is about 41 inches thick. The upper part is mottled yellowish brown and gray, friable silty clay loam, and the lower part is mottled gray and yellowish brown, friable clay loam and sandy loam. The underlying material to a depth of 60 inches is mottled gray and yellowish brown, stratified sandy loam and coarse sand. In places the surface layer is thinner and lighter in color. In some areas part of the underlying material is calcareous loam till. In other areas the subsoil contains more sand.

Included with this soil in mapping are small areas of the well drained Camden soils, the poorly drained Drummer and Thorp soils, and the moderately well drained Proctor soils. Camden and Proctor soils are on slight rises above the Millbrook soil. Drummer and Thorp soils are in drainageways and depressions below the Millbrook soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Millbrook soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1.0 to 3.0 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderate. Reaction ranges from strongly acid to mildly alkaline in the subsoil and varies in the surface layer as a result of local liming practices. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

In areas used for corn, soybeans, or small grain, a drainage system may be needed to improve productivity. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

Pasture plants and hay grow well on this soil. Harvesting or grazing when the soil is too wet and overgrazing, however, reduce forage production and cause surface compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, timely

Unmowed strips, 30 to 50 feet wide, at the edge of hayland provide excellent nesting cover for openland wildlife.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. It can be lowered, however, by installing foundation drains. If the soil is used as a septic tank absorption field, the seasonal high water table and the moderate permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the slow absorption of liquid waste.

The capability class is I.

221B—Parr silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on ridges and knolls on till plains and moraines. Individual areas are irregular in shape and range from 2 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 10 inches thick. The subsoil is about 21 inches thick. The upper part is brown and light olive brown, firm clay loam, and the lower part is light olive brown, friable loam. The underlying material to a depth of 60 inches is light olive brown, mottled, calcareous loam. In places the surface layer is lighter in color. In some areas the subsoil contains more clay and less sand. In other areas the underlying material is brown, stratified loam and loamy sand.

Included with this soil in mapping are small areas of the poorly drained Drummer soils and the somewhat poorly drained Odell and Raub soils. These soils are in drainageways or on slopes below the Parr soil They make up 2 to 8 percent of the unit.

Water and air move through the Parr soil at a moderate rate. Surface runoff is medium in cultivated areas. Available water capacity is moderate. Organic matter content also is moderate. Reaction ranges from slightly acid to mildly alkaline in the subsoil and varies in the surface layer as a result of local liming practices. In areas where the plow layer contains subsoil material, the surface layer tends to crust after hard rains. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated. This soil is well suited to cultivated crops and to pasture and hay, openland wildlife habitat, dwellings with basements, and lawns and landscaping. It is moderately well suited to dwellings without basements and to septic tank absorption fields and local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, terraces, or a combination of these. Returning crop residue to the soil helps to maintain tilth and fertility.

If this soil is used as a site for dwellings without

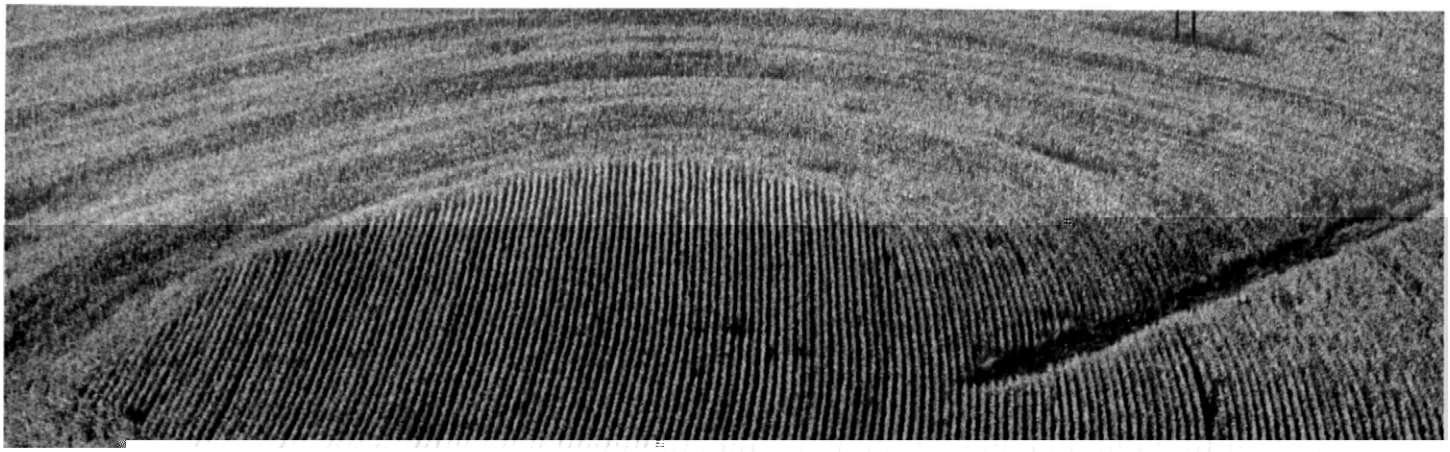


Figure 10.—Terraces and grassed waterways on Parr silt loam, 5 to 10 percent slopes, eroded.

structural damage caused by shrinking and swelling. If the soil is used as a septic tank absorption field, the moderate permeability is a limitation. Enlarging the absorption area, however, helps to overcome the slow

Included with this soil in mapping are small areas of the poorly drained Drummer soils and the somewhat poorly drained Flanagan and Raub soils. These soils are in drainageways and on slopes below the Parr soil. The

conservation tillage that leaves crop residue on the surface after planting, contour farming, terraces, or a combination of these can keep soil loss at an acceptable level and thus maintain the productivity of the soil (fig. 10).

planting help to keep soil loss at an acceptable level and thus maintain the productivity of the soil. Terraces also help to control erosion. Returning crop residue to the soil helps to maintain tilth and fertility.

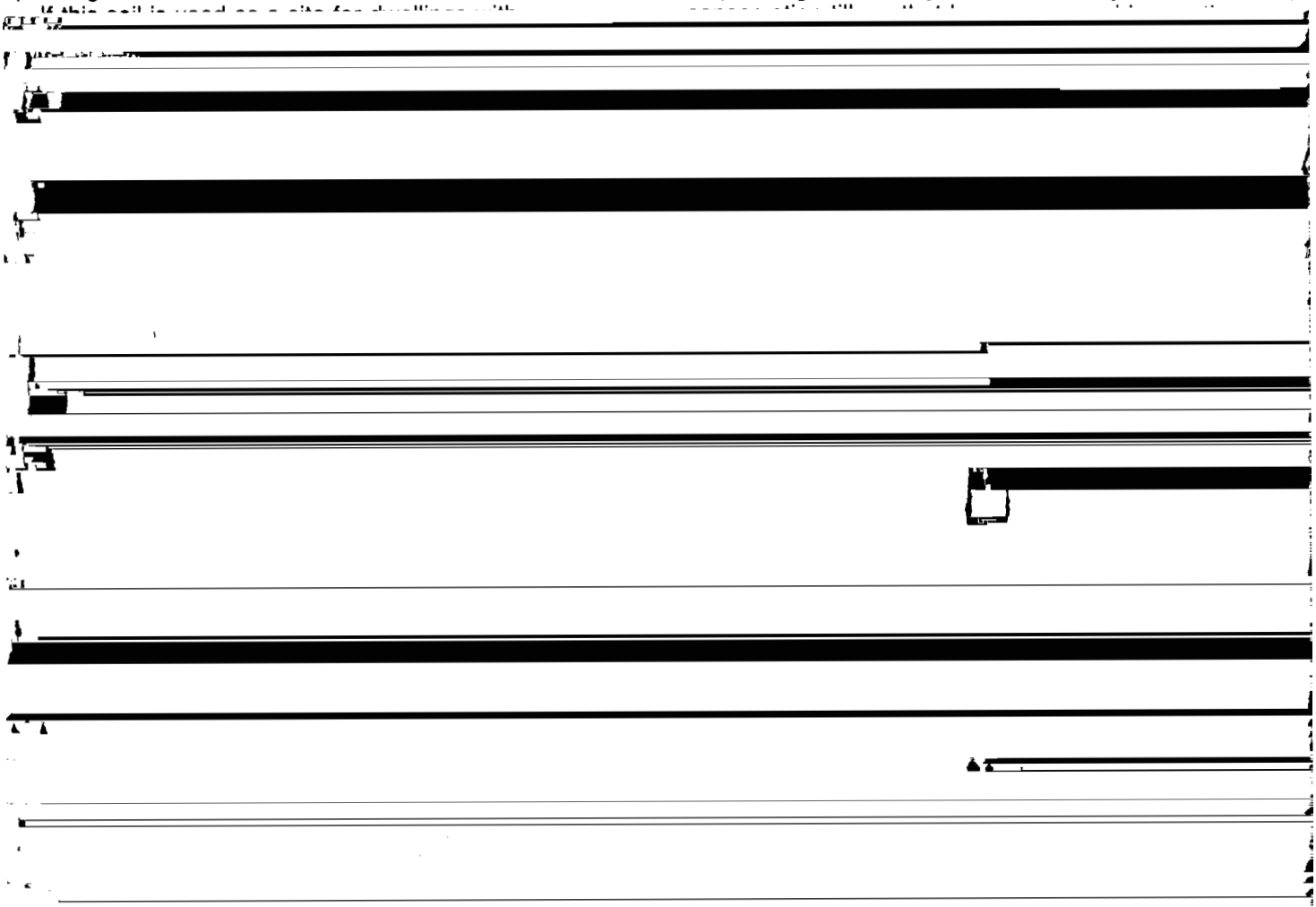
Establishing pasture plants or hay on this soil helps to

to septic tank absorption fields and local roads and streets.

If this soil is used for corn, soybeans, or small grain, further erosion is a hazard. It can be controlled, however, by contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, or terraces.

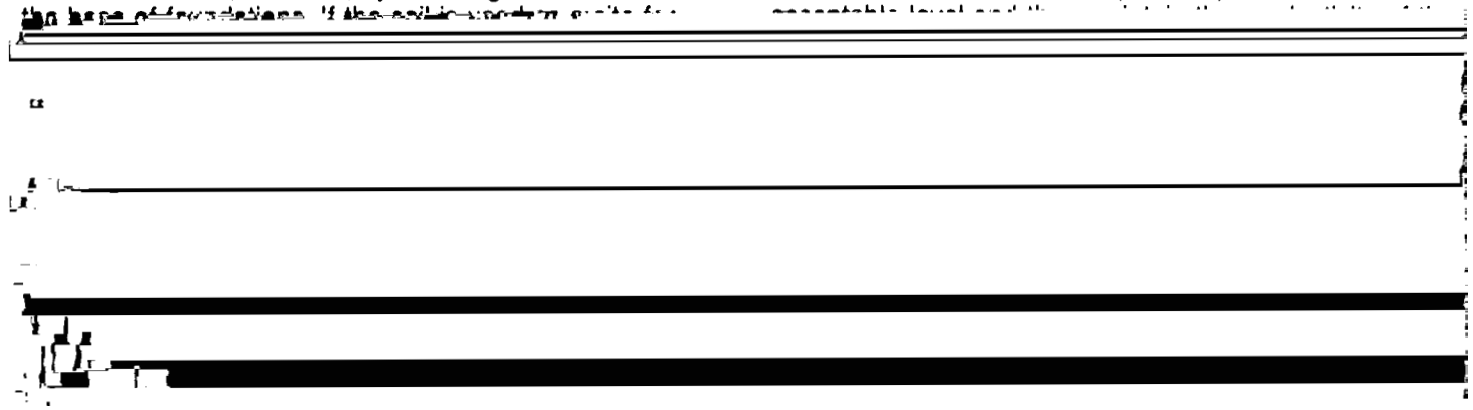
and moderately well suited to pasture and hay. It is moderately well suited to dwellings and is poorly suited to septic tank absorption fields and local roads and streets.

If this soil is used for corn or soybeans, the hazard of further erosion is severe. A crop rotation in which forage crops are grown for 1 year or more, a system of



basements, the seasonal high water table is a limitation. It can be lowered, however, by installing tile lines around

surface after planting, contour farming, terraces, or a combination of these can help to keep soil loss at an



moderately well drained Varna soils. These soils are on ridgetops and side slopes above the Ashkum soil. They make up 2 to 8 percent of the unit.

Water and air move through the Ashkum soil at a moderately slow rate. Surface runoff is slow to ponded in cultivated areas. A seasonal high water table ranges from 1.0 foot above the surface to 1.0 foot below during the spring. Available water capacity is high. Organic matter content also is high. Reaction ranges from slightly acid to moderately alkaline in the subsoil and varies in the surface soil as a result of local liming practices. The firm surface soil is compact and cloddy if it has been plowed when wet. The shrink-swell potential and the potential for frost action are high.

mottled yellowish brown and pale brown, calcareous loam. In some areas the surface soil is darker. In a few places the subsoil is loamy within a depth of 40 inches.

Included with this soil in mapping are small areas of the poorly drained Drummer soils and the somewhat poorly drained Sabina and Sunbury soils. Drummer soils are in shallow depressions and drainageways below the Birkbeck soil. The nearly level Sabina and Sunbury soils also are lower on the landscape than the Birkbeck soil. Included soils make up 2 to 7 percent of the unit.

Water and air move through the Birkbeck soil at a moderate rate. Surface runoff is medium in cultivated areas. A seasonal high water table is 3.0 to 6.0 feet below the surface during the spring. Available water

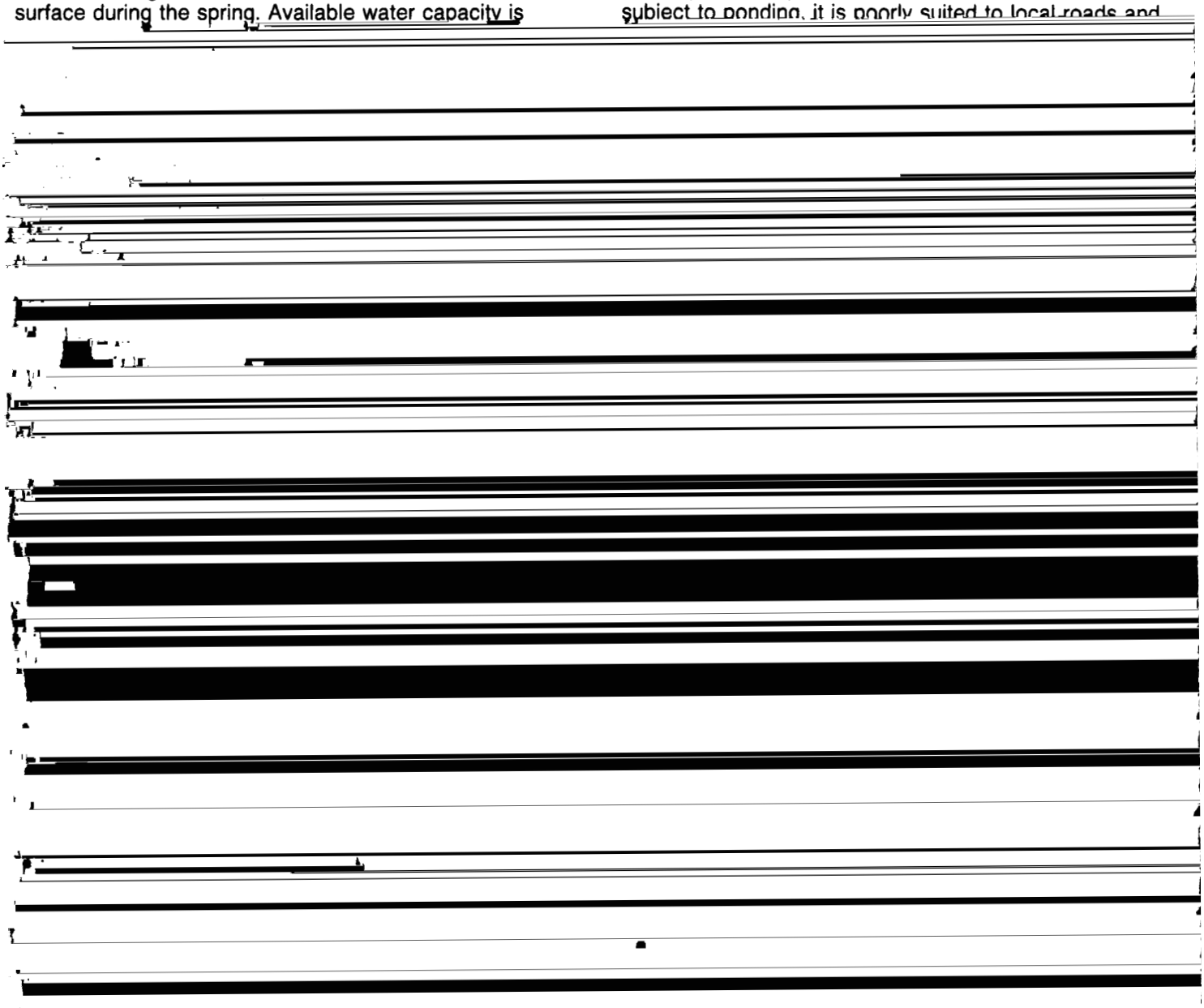
light olive brown and gray, mottled, calcareous loam. In places the surface soil is thicker and darker. In some areas the underlying material is stratified loam and sandy loam. In other areas the subsoil is thinner.

Included with this soil in mapping are small areas of the moderately well drained Birkbeck and Catlin soils and the poorly drained Drummer soils. Birkbeck and Catlin soils are on slight rises above the Sunbury soil, and Drummer soils are in drainageways below the Sunbury soil. Included soils make up 2 to 10 percent of the unit.

Water and air move through the Sunbury soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1.0 to 3.0 feet below the surface during the spring. Available water capacity is

Water and air move through the Bryce soil at a slow rate. Surface runoff is slow to ponded in cultivated areas. A seasonal high water table ranges from 1.0 foot above the surface to 1.0 foot below during the spring. Available water capacity is moderate. Organic matter content is high. Reaction is neutral to mildly alkaline in the subsoil and varies in the surface soil as a result of local liming practices. The surface soil is in poor tilth and is compact and cloddy if it has been plowed when too wet. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and is moderately well suited to pasture and hay and to openland wildlife habitat. Because it is subject to ponding, it is poorly suited to local roads and



[redacted]

Figure 11.—Surface crusting on Chatsworth silty clay, 7 to 15 percent slopes.

depressions and drainageways. These soils make up 2 to 10 percent of the unit.

Water and air move through the Kendall soil at a moderate rate. Surface runoff is slow in cultivated areas. A seasonal high water table is 1.0 to 3.0 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. Reaction ranges from strongly acid to slightly acid in the subsoil and varies in the surface layer as a result of local liming practices. The surface layer tends to crust after hard rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to habitat for openland and woodland wildlife. It is moderately well suited to lawns and landscaping and is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

Because a drainage system has been installed, this soil is sufficiently drained for corn, soybeans, and small grain. Measures that maintain the drainage system are needed. Tile drains and surface drains function satisfactorily if suitable outlets are available. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

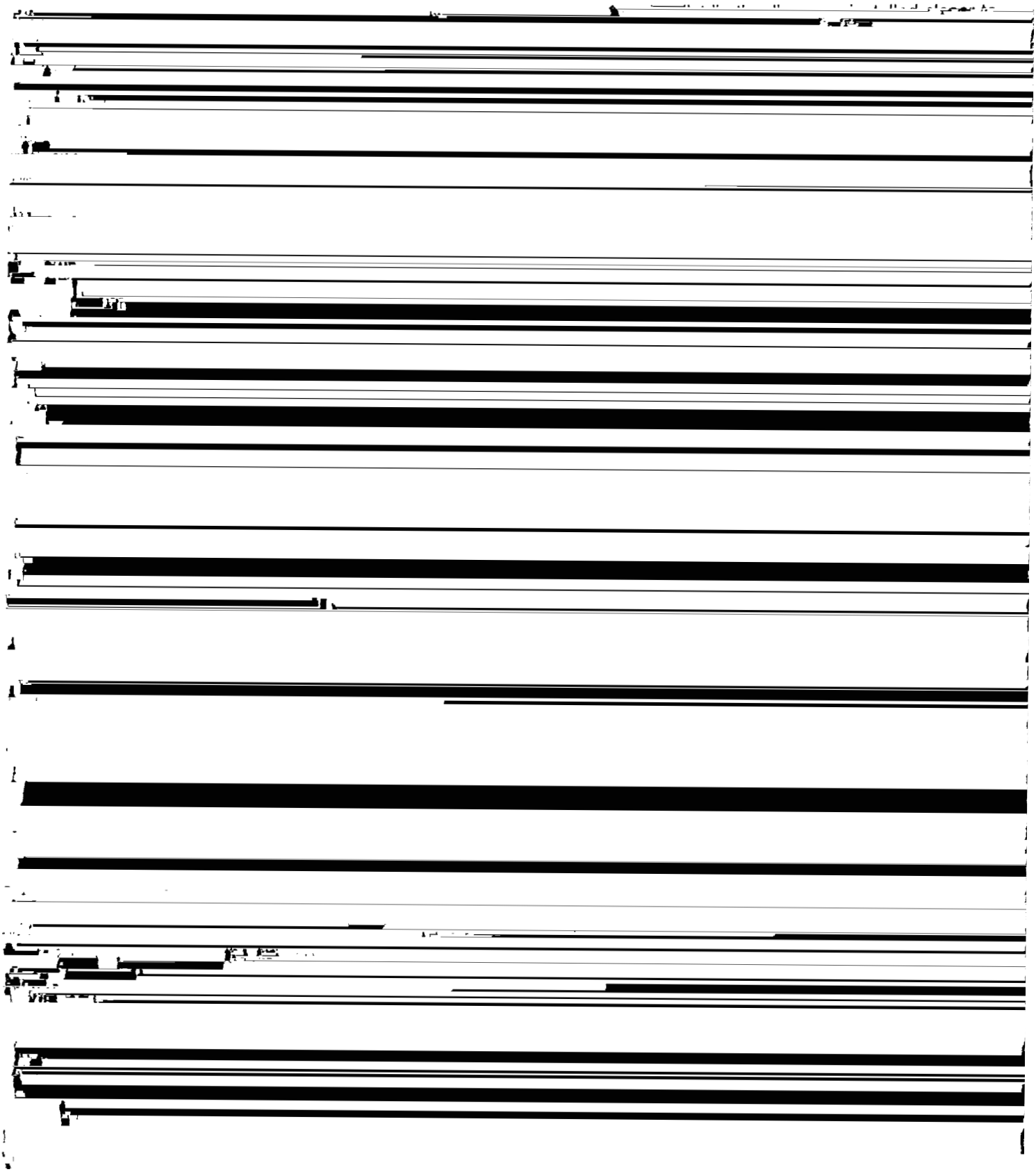
Pasture plants and hay grow well on this soil. Overgrazing or grazing when the soil is too wet, however, reduces forage production and causes surface compaction, excessive runoff, and poor tilth. Proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

If this soil is used as a site for dwellings or septic tank absorption fields, the seasonal high water table is a limitation. Also, the shrink-swell potential is a limitation on sites for dwellings. Underground drains help to lower the water table. Reinforcing foundations helps to prevent the structural damage caused by shrinking and swelling. Installing a drainage system helps to establish lawns and ornamental trees and shrubs.

The capability subclass is IIw.

243B—St. Charles silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on upland ridges and on slight rises on outwash plains. Individual areas are irregular in shape and range from 10 to 80 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsurface layer is brown, friable silt loam about 2 inches thick. The subsoil is about 45 inches thick. The upper part is brown



deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing tile drains around foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

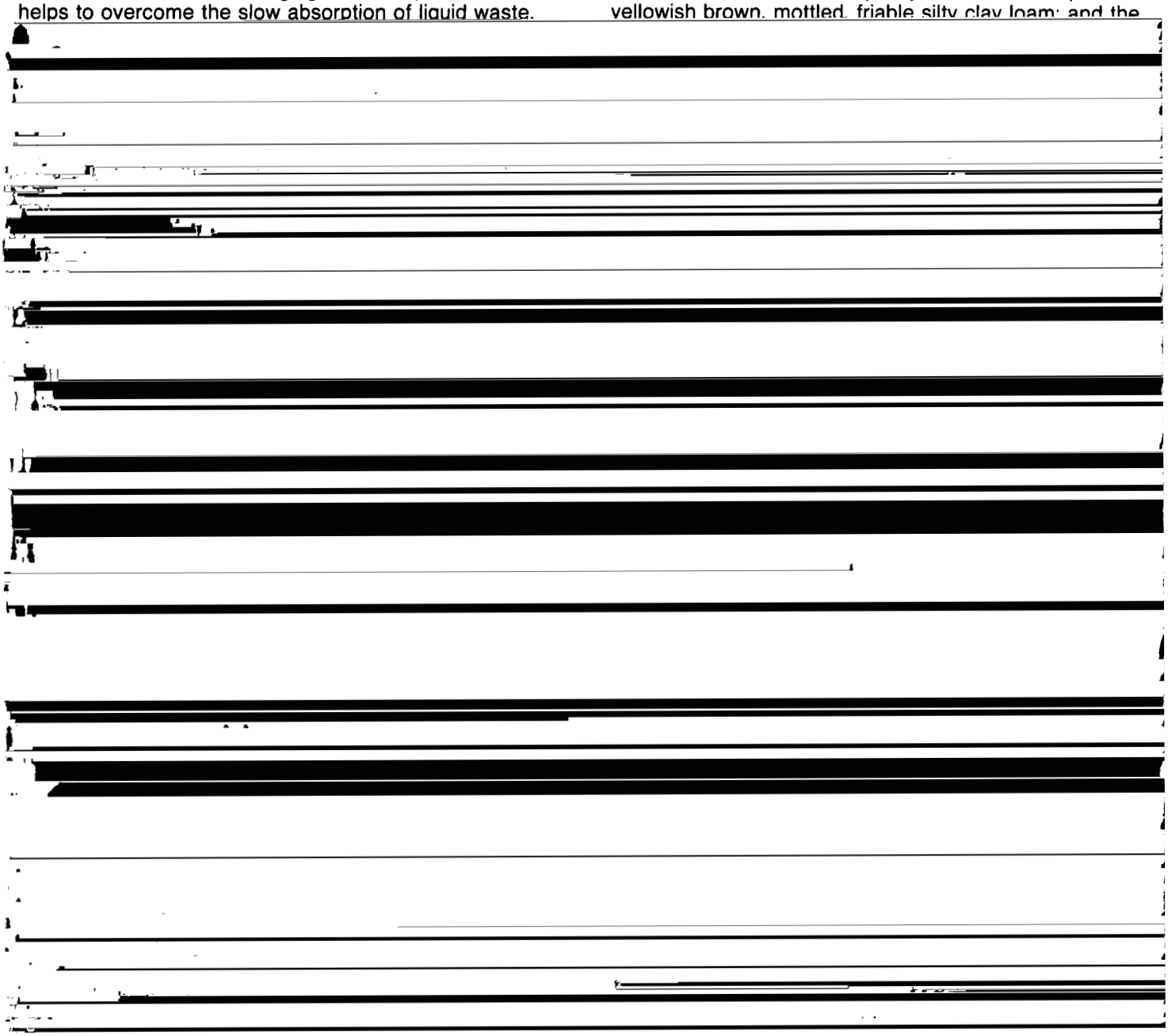
If this soil is used as a septic tank absorption field, the seasonal high water table and the moderately slow permeability are limitations. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the slow absorption of liquid waste.

wild herbaceous plants, wetland plants, and other important habitat elements.

The capability subclass is IIw.

322C2—Russell silt loam, 4 to 11 percent slopes, eroded. This sloping, well drained soil is on short, uneven side slopes on till plains. Individual areas are irregular in shape and range from 3 to 75 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is brown, friable silt loam about 3 inches thick. The subsoil is about 40 inches thick. The upper part is dark yellowish brown, friable silty clay loam; the next part is yellowish brown, mottled, friable silty clay loam; and the



keep the pasture in good condition and to help control erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing foundations, [illegible] to prevent the structural damage caused

mottled, firm silty clay loam about 28 inches thick. The underlying material to a depth of 70 inches is gray, mottled silty clay loam. In places the surface soil is thinner. In some areas the surface soil and subsoil contain less clay. In other areas the underlying material

it has been plowed when too wet. The potential for frost action and the shrink-swell potential are high.

Most areas are cultivated. This soil is well suited to cultivated crops in drained areas and to wetland wildlife habitat in undrained areas. It is moderately well suited to pasture and hay. Because it is subject to ponding, it is poorly suited to dwellings and local roads and streets and generally is unsuited to septic tank absorption fields.

Because a drainage system has been installed, this soil is sufficiently drained for corn, soybeans, and small grain. Measures that maintain or improve the drainage system are needed. Surface drains function satisfactorily if suitable outlets are available. Land grading also helps to control the ponding. Keeping tillage at a minimum and returning crop residue to the soil help to maintain tilth and fertility.

varies in the surface layer as a result of local liming practices. The shrink-swell potential and the potential for frost action are moderate.

Most areas are cultivated. This soil is well suited to cultivated crops and to pasture and hay, habitat for openland and woodland wildlife, and septic tank absorption fields. It is moderately well suited to dwellings and local roads and streets. It is a probable source of sand and gravel.

If this soil is used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, terraces, or a combination of these.

Establishing pasture plants or hay on this soil helps to

to septic tank absorption fields and cultivated crops. It is a probable source of sand and gravel (fig. 13).

[redacted]

the surface soil as a result of local liming practices. The shrink-swell potential and the potential for frost action are moderate.

[redacted]

Figure 13.—An area of Ockley clay loam, 5 to 12 percent slopes, severely eroded. This soil is a source of sand and gravel.

If this soil is used for pasture and hay, a drainage system and measures that control flooding are needed. Overgrazing reduces forage yields and causes surface compaction and poor tilth. Restricted use during wet periods helps to keep the pasture and the soil in good condition.

This soil provides good habitat for wetland wildlife. In most areas it is on both sides of the major streams, which provide habitat for game fish. Shallow water areas

subgrade material, however, helps to overcome these limitations.

The capability subclass is IIe.

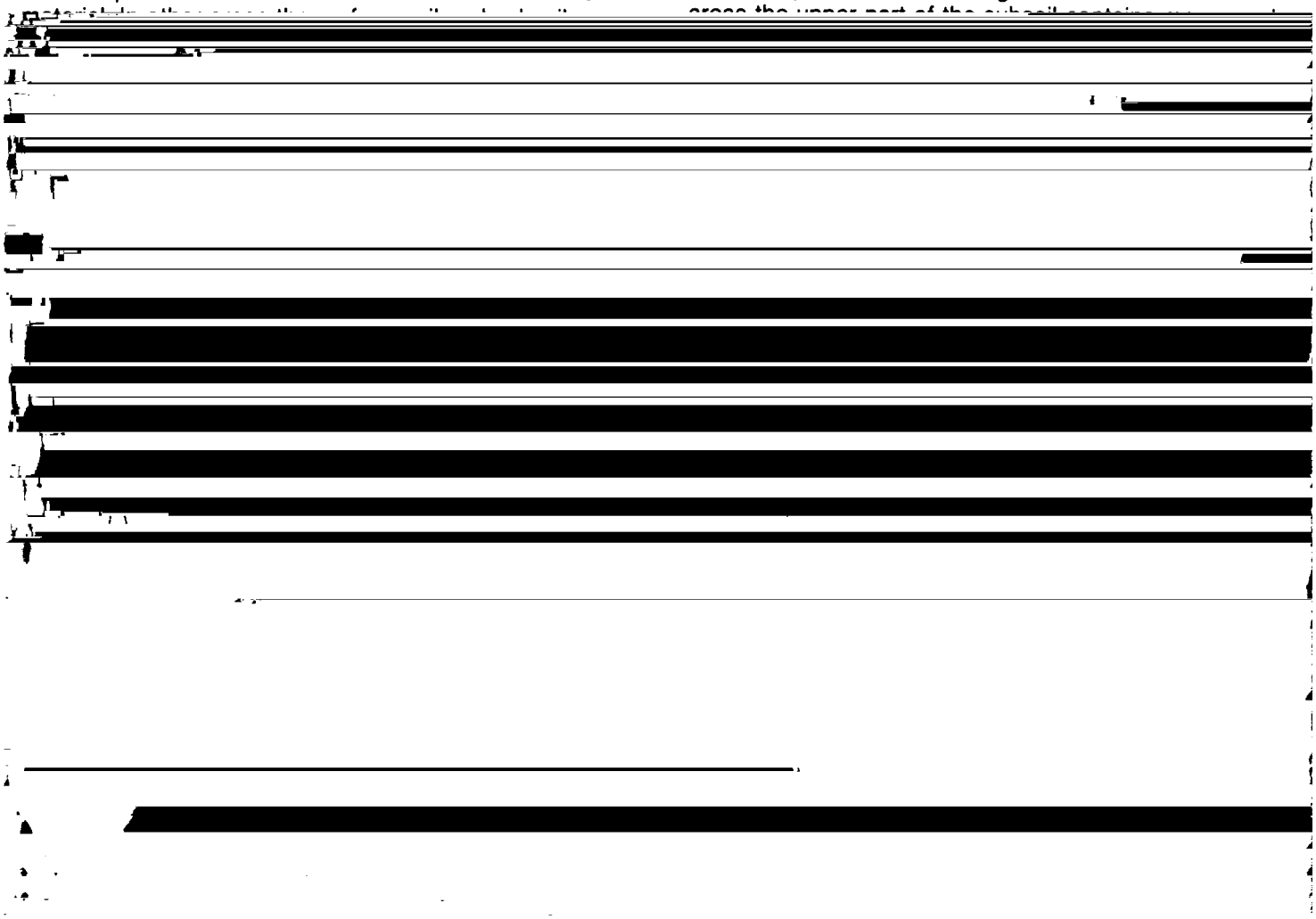
440C2—Jasper loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on knolls and short, uneven side slopes on stream terraces and outwash plains. Individual areas are irregular in shape and range from 2 to 75 acres in size.

448B—Mona silt loam, 2 to 7 percent slopes. This gently sloping, moderately well drained soil is on upland ridges and knolls. Individual areas are irregular in shape and range from 3 to 20 acres in size.

Typically, the surface soil is very dark grayish brown and dark brown, friable silt loam about 15 inches thick. The subsoil is about 38 inches thick. The upper part is yellowish brown, friable silty clay loam; the next part is dark yellowish brown, mottled, friable clay loam and sandy clay loam; and the lower part is light olive brown, firm silty clay. The underlying material to a depth of 60 inches is light olive brown, mottled, calcareous silty clay. In some plowed areas the surface soil contains subsoil

481A—Raub silt loam, 0 to 3 percent slopes. This nearly level, somewhat poorly drained soil is on slight rises on till plains and on toe slopes of terminal moraines. Individual areas are irregular in shape and range from 2 to 300 acres in size.

Typically, the surface soil is black and very dark grayish brown, friable silt loam about 18 inches thick. The subsoil is about 32 inches thick. It is yellowish brown and mottled. The upper part is friable and firm silty clay loam, and the lower part is firm clay loam. The underlying material to a depth of 60 inches is mottled yellowish brown and gray, calcareous loam. In places the surface layer is thinner and lighter in color. In some



contain more clay and less sand. In a few areas the underlying material is brown, stratified, loamy outwash.

Included with this soil in mapping are small areas of the poorly drained Bryce soils and the somewhat poorly drained Swygert soils. These soils are on toe slopes and in drainageways below the Mona soil. They make up 5 to 15 percent of the unit.

Water and air move through the Mona soil at a

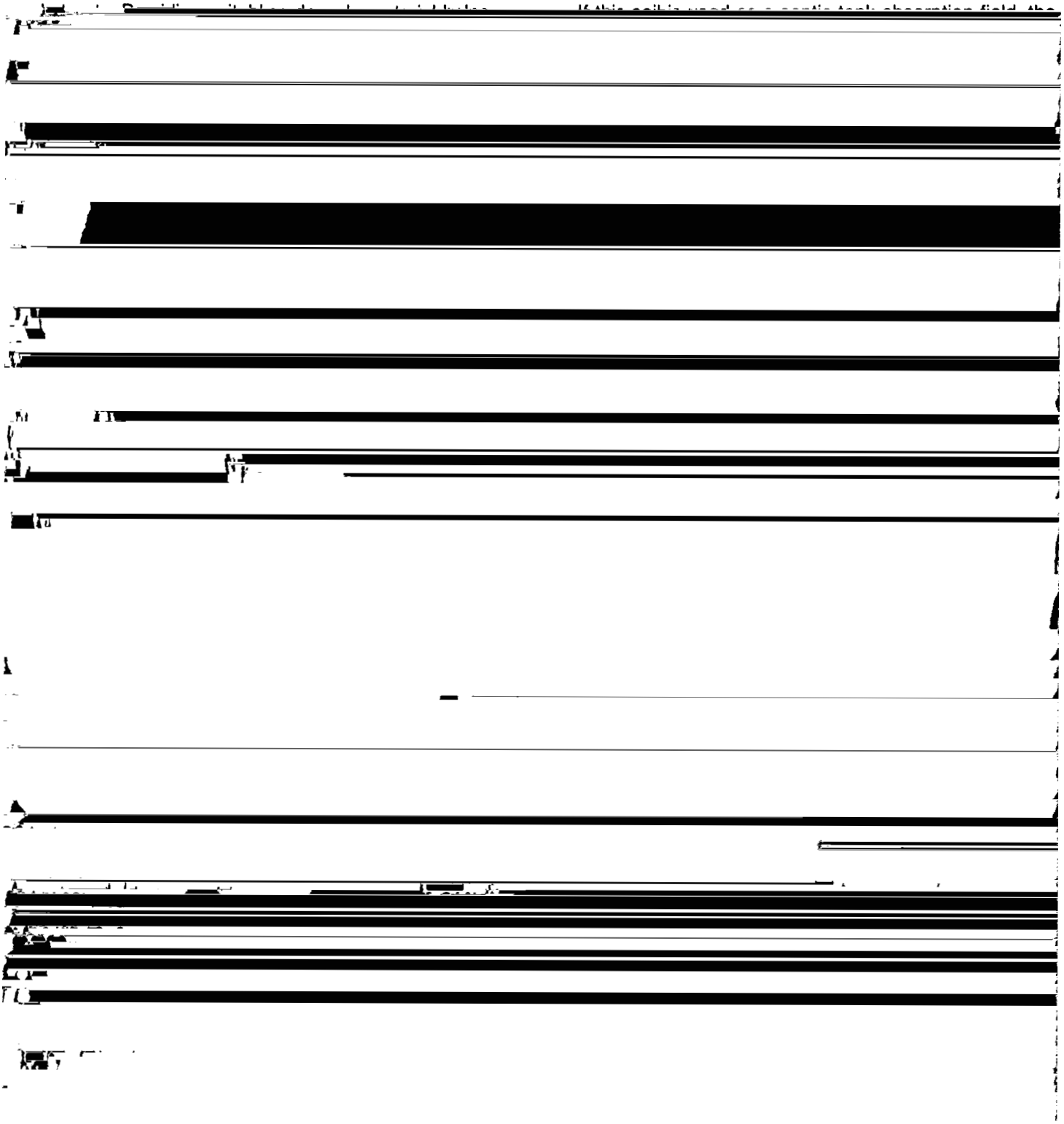
In other areas part of the underlying material is brown, stratified loam, sandy loam, and sand.

Included with this soil in mapping are small areas of the moderately well drained Dana soils, the poorly drained Drummer soils, and the well drained Parr soils. Dana and Parr soils are on ridges and side slopes above the Raub soil, and Drummer soils are in depressions and drainageways below the Raub soil. Included soils make

lower the water table. Enlarging the absorption area helps to overcome the slow absorption of liquid waste.

Low strength, the seasonal high water table, the potential for frost action, and the shrink-swell potential are limitations if this soil is used as a site for local roads

foundations helps to lower the water table. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling. Installing a drainage system helps to establish lawns and ornamental trees and shrubs.



inches thick. The subsurface layer is brown, friable silt loam about 3 inches thick. The subsoil is about 41 inches thick. It is friable. The upper part is yellowish brown silty clay loam; the next part is dark yellowish brown clay loam and sandy clay loam; and the lower part is yellowish brown, stratified silt loam and loam. The underlying material to a depth of 72 inches is mottled yellowish brown and dark grayish brown, stratified silt loam, loam, and sandy clay loam. In places the surface layer is darker. In some areas the underlying material is calcareous loam till. In other areas the middle part of the subsoil contains less sand and more silt.

Included with this soil in mapping are small areas of the poorly drained Drummer soils and the somewhat poorly drained Kendall soils. These soils are in shallow depressions and drainageways below the Martinsville soil. They make up 2 to 10 percent of the unit.

Water and air move through the Martinsville soil at a moderate rate. Surface runoff is medium in cultivated areas. Available water capacity is high. Organic matter content is moderately low. Reaction ranges from strongly acid to mildly alkaline in the subsoil and from medium acid to neutral in the surface layer. The shrink-swell potential and the potential for frost action are moderate.

Most areas are used for pasture or hay. This soil is well suited to cultivated crops and to pasture and hay, habitat for openland and woodland wildlife, lawns and landscaping, and septic tank absorption fields. It is moderately well suited to dwellings and is poorly suited to local roads and streets.

In the areas used for corn, soybeans, or small grain, erosion is a slight hazard. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, terraces, or a combination of these.

Pasture plants and hay grow well on this soil. Overgrazing, however, reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to erosion. Pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing foundations, however, helps to prevent the structural damage caused by shrinking and swelling.

The capability subclass is IIe.

570C2—Martinsville loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on short, uneven side slopes on stream terraces. Individual areas are irregularly shaped or oblong and range from 5 to 35 [illegible] in size.

is brown sandy loam. The underlying material to a depth of 72 inches is mottled yellowish brown and dark grayish brown, stratified sandy loam, sandy clay loam, and silt loam. In some areas the underlying material is calcareous loam till, and in others it is calcareous sand and gravel. In a few places the subsoil contains less sand and more silt.

Included with this soil in mapping are small areas of the poorly drained Colo and Drummer soils and the somewhat poorly drained Kendall soils. These soils are lower on the landscape than the Martinsville soil. They make up 1 to 7 percent of the unit.

Water and air move through the Martinsville soil at a moderate rate. Surface runoff is medium in cultivated areas. Available water capacity is high. Organic matter content is moderately low. Reaction ranges from strongly acid to neutral in the subsoil and from medium acid to neutral in the surface layer. The surface layer tends to crust after hard rains. The shrink-swell potential and the potential for frost action are moderate.

Most areas are wooded. This soil is well suited to cultivated crops and to pasture and hay, habitat for openland and woodland wildlife, septic tank absorption fields, and lawns and landscaping. It is moderately well suited to dwellings and is poorly suited to local roads and streets.

If this soil is used for pasture, timely deferment of grazing and pasture rotation are needed to prevent surface compaction and excessive runoff and erosion. If possible, the pasture or hayland should be tilled on the contour when a seedbed is prepared.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Reinforcing foundations, however, helps to prevent the structural damage caused by shrinking and swelling.

The capability subclass is IIIe.

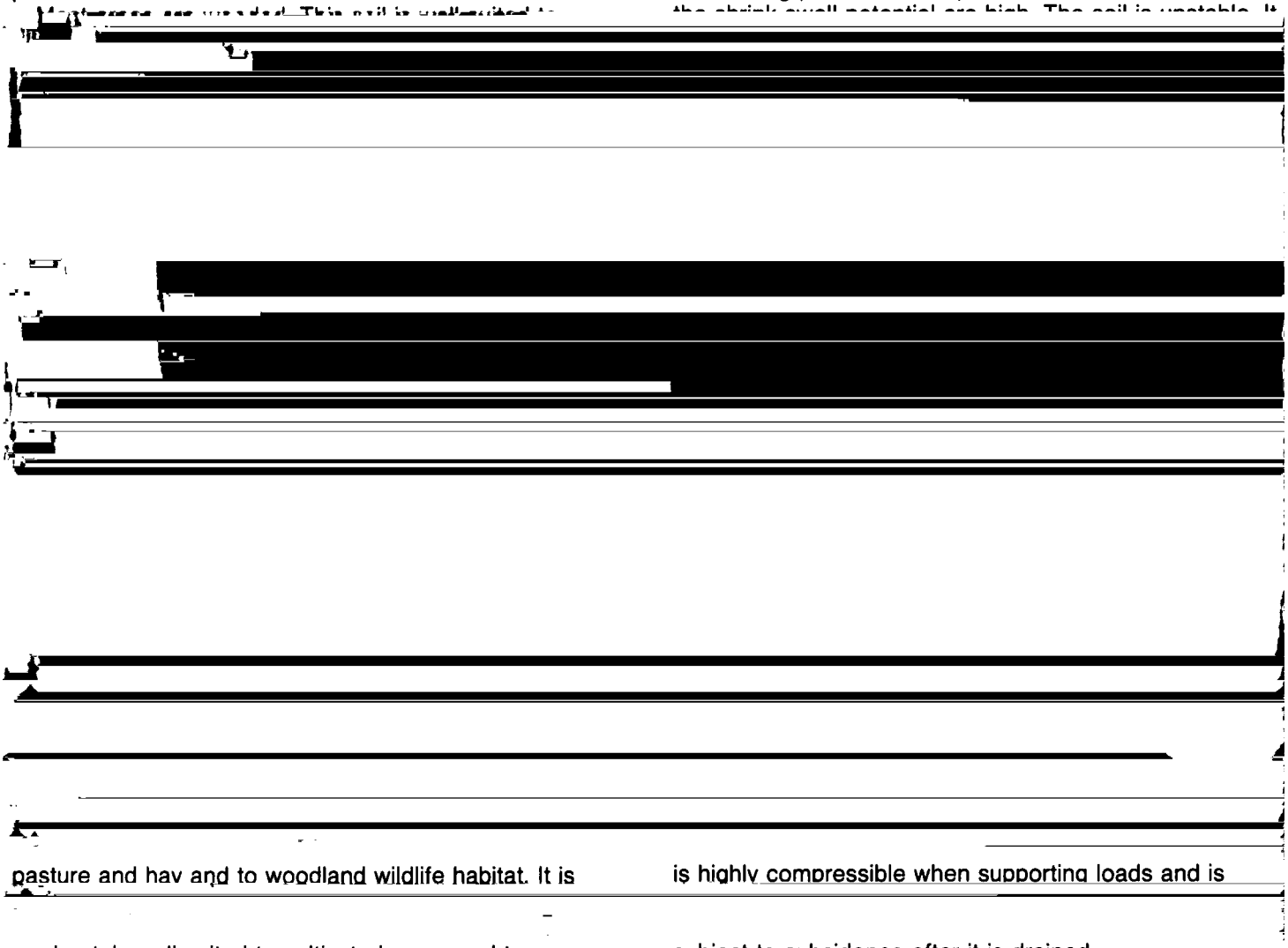
570D2—Martinsville loam, 10 to 18 percent slopes, eroded. This strongly sloping, well drained soil is on short, uneven side slopes on stream terraces. Individual areas are linear or oblong and range from 2 to 25 acres in size.

Typically, the surface layer is dark grayish brown, friable loam about 9 inches thick. The subsoil is about 27 inches thick. It is friable. The upper part is dark yellowish brown clay loam, and the lower part is brown sandy loam and loam. The underlying material to a depth of 72 inches is brown, stratified silt loam, sandy clay loam, and loam. In some areas the underlying material is calcareous loam till, and in others it is calcareous sand and gravel. In a few places the subsoil contains more [illegible]

Martinsville soil. Included soils make up 1 to 8 percent of the unit.

Water and air move through the Martinsville soil at a moderate rate. Surface runoff is rapid in cultivated areas. Available water capacity is high. Organic matter content is moderately low. Reaction ranges from strongly acid to neutral in the subsoil and from medium acid to neutral in the surface layer. The shrink-swell potential and the potential for frost action are moderate.

Water and air move through the upper part of the Muskego soil at a moderate or moderately rapid rate and through the underlying material at a slow rate. Surface runoff is very slow or ponded in cultivated areas. A seasonal high water table ranges from 1 foot above the surface to 1 foot below during the spring. Available water capacity is very high. Organic matter content also is very high. Reaction varies in the surface soil as a result of local liming practices. The potential for frost action and



pasture and hay and to woodland wildlife habitat. It is

is highly compressible when supporting loads and is

moderately well suited to cultivated crops and to dwellings, septic tank absorption fields, and nature paths and trails and is poorly suited to local roads and streets.

This soil provides good habitat for woodland wildlife. Measures that exclude livestock help to prevent the depletion of the shrubs and sprouts that provide food and cover for woodland wildlife, such as deer, squirrels, and a variety of songbirds. Hedges and rows of shrubs provide cover for doves and many songbirds.

Nature paths and trails can be constructed in areas where the slope is less than 15 percent. In the steeper areas, either land leveling or stairways and handrails are

subject to subsidence after it is drained.

Most areas are cultivated. This soil is well suited to wetland wildlife habitat and is moderately well suited to cultivated crops and to pasture and hay. Because it is subject to ponding, it is poorly suited to local roads and streets and generally is unsuited to dwellings and septic tank absorption fields.

Because a drainage system has been installed in many areas, this soil commonly is sufficiently drained for corn, soybeans, and small grain. Measures that maintain the drainage system are needed. Surface drains function satisfactorily if suitable outlets are available. Tile drains

Figure 14.—A severely eroded area of Orthents, loamy.

because the texture varies. The content of organic matter and plant nutrients generally is moderate.

Most areas are idle or are developed for residential or other nonfarm uses. Unless a good plant cover protects the surface, erosion is a severe hazard. It is especially severe in the more sloping areas, which are easily eroded (fig. 14). In severely eroded areas, special management is needed to establish and maintain a plant cover that controls runoff and erosion. The plant cover ranges from none in newly exposed areas to a good cover of sod in some developed areas. Onsite investigation is needed to determine the limitations or hazards affecting the development of specific areas for urban uses.

This map unit is not assigned to a capability class or subclass.

865—Pits, gravel. This map unit consists of excavations from which gravel and some sand have been removed. It generally is on outwash plains, on benches near streams, or on kames. The gravel is used mainly as roadfill or other construction material. Individual areas are square, rectangular, or irregularly shaped and range from 2 to 80 acres in size.

The excavations commonly are 10 to 50 feet deep. Many are filled with water and are described as water areas on the soil maps. The surrounding soil material generally was scraped or mixed when the sand and gravel were mined. It is mainly low in fertility and in organic matter content. Available water capacity varies.

Some abandoned pits can be filled with solid refuse and then covered with clean fill material. The fill should settle and be stable before it is graded. If reclaimed, some areas are suitable for recreational uses, such as hiking paths and trails and fishing areas, or for commercial and industrial uses. Topdressing generally is needed to establish vegetation. The feasibility of reclamation depends on the condition at the site and the proposed alternative use. Onsite investigation is needed to plan the development for a specific use.

This map unit is not assigned to a capability class or subclass.

2027C—Miami-Urban land complex, 2 to 10 percent slopes. This map unit occurs as areas of a sloping, well drained Miami soil intermingled with gently sloping areas

slow permeability is a limitation. Enlarging the absorption area, however, helps to overcome the slow absorption of liquid waste.

If the Miami soil is used as a site for local roads and streets, low strength and the potential for frost action are limitations. They can be overcome, however, by

The Drummer soil, or open part of the map unit, is used for parks, building site development, lawns, gardens, and golf courses. It is poorly suited to dwellings and local roads and streets and generally is unsuited to septic tank absorption fields. Because of the seasonal

color. In other areas the underlying material is stratified loam, silt loam, and sandy loam. Some of the low areas have been filled or leveled during construction. Other small areas have been cut, built up, or smoothed.

The Urban land is covered by streets, parking lots,

flower gardens, ornamental trees and shrubs, and recreational uses. Lowering the water table with underground drains and installing surface drains help to overcome this limitation. Erosion is a hazard in areas where the surface is bare and in areas used as watercourses.

If the Drummer soil is used as a site for dwellings or septic tank absorption fields, the ponding is a hazard. Also, the shrink-swell potential is a limitation on sites for

obscured or modified that they cannot be identified.

Included with the Flanagan soil in mapping are small areas of Catlin, Dana, and Drummer soils. The moderately well drained Catlin and Dana soils are in convex areas above the Flanagan soil, and the poorly drained Drummer soils are in slight depressions and drainageways below the Flanagan soil. Included soils make up 15 to 25 percent of the unit.

In most areas excess water is drained through storm

This map unit is not assigned to a capability class or subclass.

2171B—Catlin-Urban land complex, 2 to 7 percent slopes. This gently sloping map unit occurs as areas of a moderately well drained Catlin soil intermingled with areas of Urban land. It is on upland ridges. Individual areas range from 5 to 250 acres in size. They are 40 to 55 percent Catlin soil and 35 to 45 percent Urban land. The Catlin soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Catlin soil has a surface layer of very dark grayish brown, friable silt loam about 11 inches thick. The subsoil is about 46 inches thick. The upper part is dark yellowish brown, friable silty clay loam; the

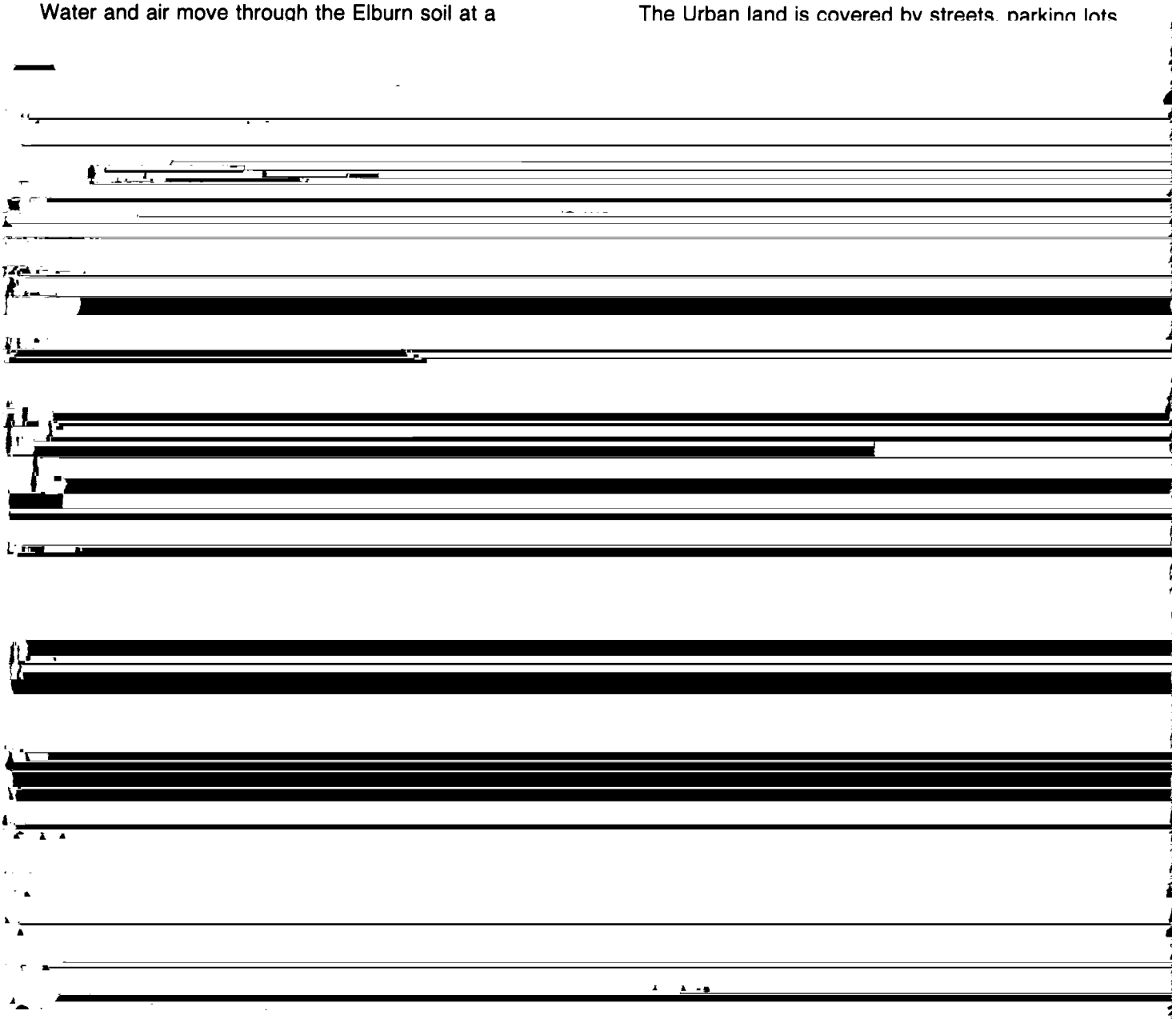
high water table is a limitation on sites for dwellings with basements. It can be lowered, however, by installing tile drains at the base of foundations. Reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

If the Catlin soil is used as a septic tank absorption field, the seasonal high water table is a limitation. It can be lowered, however, by installing underground drains. If this measure is not feasible, municipal sanitary treatment facilities should be used.

Low strength and the potential for frost action are limitations if the Catlin soil is used as a site for local roads and streets. Strengthening or replacing the subgrade material helps to prevent the damage caused by low strength and frost action. Installing a drainage system and then grading the roads so that they shed

Water and air move through the Elburn soil at a

The Urban land is covered by streets, parking lots



capacity is high. Organic matter content also is high. The surface layer and subsoil range from medium acid to mildly alkaline. The shrink-swell potential is moderate, and the potential for frost action is high.

The Elburn soil, or open part of the map unit, is used for parks, building sites, lawns, and gardens. It is well suited to vegetable and flower gardens and ornamental trees and shrubs and is moderately well suited to lawns and landscaping and to recreational uses. It is poorly suited to dwellings, septic tank absorption fields, and local roads and streets.

If the Elburn soil is used as a site for dwellings or septic tank absorption fields, the seasonal high water table is a limitation. Also, the shrink-swell potential is a

obscured or modified that they cannot be identified.

Included with the Sabina soil in mapping are small areas of the poorly drained Drummer soils and the moderately well drained Birkbeck and Xenia soils. Birkbeck and Xenia soils are on slight rises above the Sabina soil, and Drummer soils are in shallow depressions and drainageways below the Sabina soil. Included soils make up 5 to 15 percent of the unit.

In most areas excess water is drained through sewer systems, gutters, drainage tile, and, to a lesser extent, surface ditches. Unless drained, the Sabina soil has a seasonal high water table 1 to 3 feet below the surface during the spring.

Water and air move through the Sabina soil at a

This map unit is not assigned to a capability class or subclass.

2481A—Raub-Urban land complex, 0 to 3 percent slopes. This nearly level map unit occurs as areas of a somewhat poorly drained Raub soil intermingled with areas of Urban land. It is on slight rises on till plains. Individual areas range from 5 to more than 400 acres in size. They are 40 to 60 percent Raub soil and 30 to 45 percent Urban land. The Raub soil and Urban land occur as areas so intricately mixed or so small that mapping them separately is not practical.

In a typical area of the Raub soil, the surface soil is black and very dark grayish brown, friable loam about 18 inches thick. The subsoil is about 32 inches thick. It is yellowish brown and mottled. The upper part is friable and firm silty clay loam, and the lower part is firm clay loam. The underlying material to a depth of 60 inches is mottled yellowish brown and gray, calcareous loam. In some areas the upper part of the subsoil contains more sand. Some of the lower areas have been filled or leveled during construction. Other small areas have been cut, built up, or smoothed.

The Urban land is covered by streets, parking lots, buildings, and other structures. The soils are so obscured that they cannot be identified.

Included with the Raub soil in mapping are small areas of Dana and Drummer soils. The moderately well drained Dana soils are in convex areas above the Raub soil, and the [illegible] drained Drummer soils are in slight [illegible]

shrinking and swelling. A drainage system is needed to lower the water table.

The seasonal high water table and the moderately slow permeability are limitations if the Raub soil is used as a septic tank absorption field. Underground drains help to lower the water table. Enlarging the absorption area helps to overcome the slow absorption of liquid waste. If these measures are not feasible, municipal sanitary treatment facilities should be used.

Low strength and the potential for frost action are limitations if the Raub soil is used as a site for local roads and streets. Providing suitable subgrade material helps to prevent the damage caused by low strength and frost action. Installing a drainage system and then grading the roads so that they shed water reduce the wetness and thus help to prevent the damage caused by frost action.

This map unit is not assigned to a capability class or subclass.

prime farmland

[illegible]

farmland defined by the U.S. Department of Agriculture. It is of major importance in providing the Nation's short- and long-range needs for food and fiber. Because the supply of high quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should

which are described under the heading, "General soil map units," have the highest percentage, but the prime farmland is throughout the county. About 530,000 acres of the prime farmland is used for crops, mainly corn and soybeans, which account for most of the local farm income each year (*6*).

A recent trend in land use in some parts of the county has been the loss of some prime farmland to industrial and urban uses (fig. 15). The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

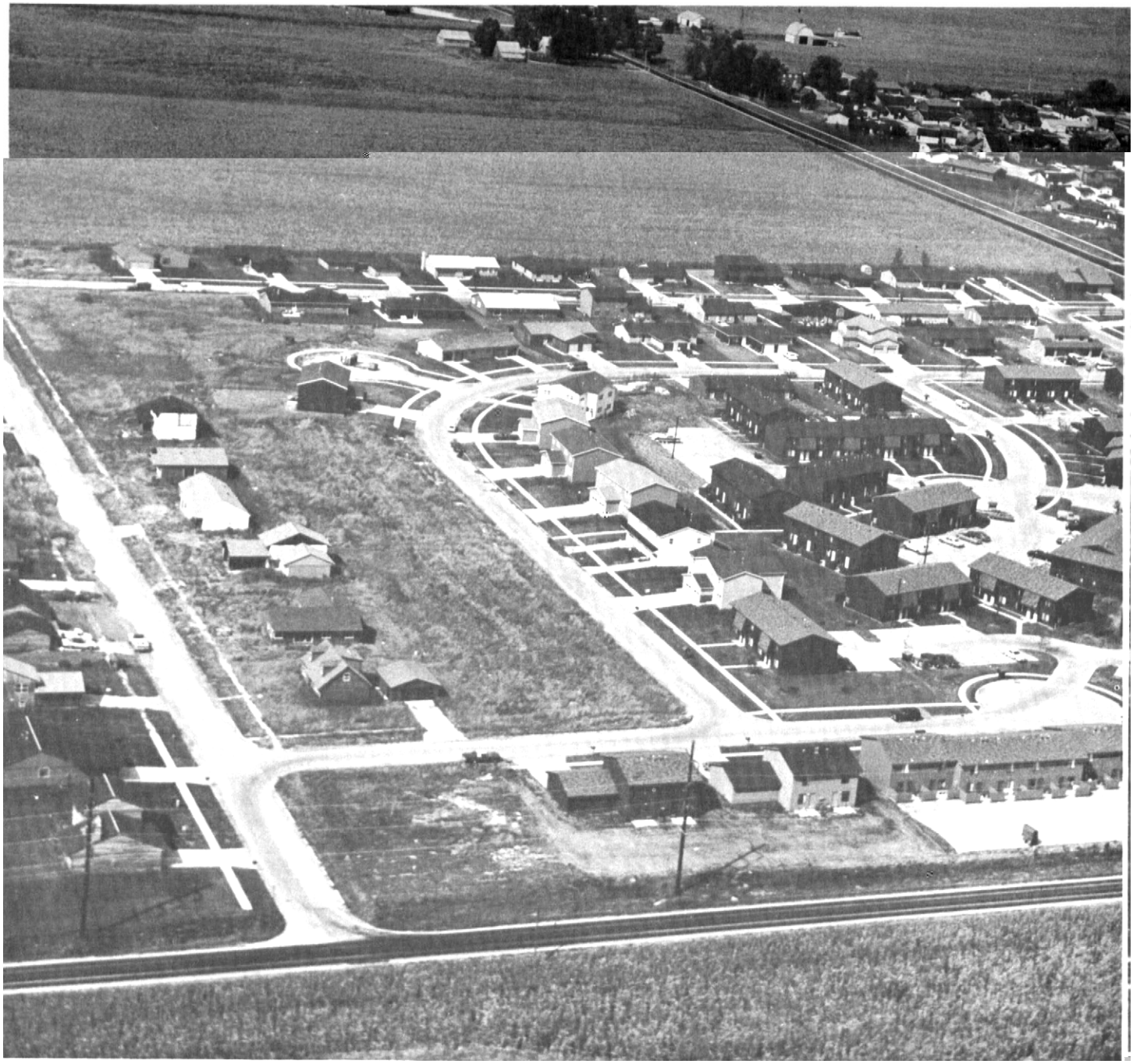


Figure 15.—Encroachment of urban development onto prime farmland.

The map units in Champaign County that meet the requirements for prime farmland are listed in this section. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed soil map units."

Some map units meet the requirements for prime farmland only in areas where the soil is drained. In the following list a qualification is added in parenthesis after the name of these map units. Onsite evaluation is needed to determine whether or not a specific area of the soil is adequately drained. In Champaign County the naturally wet soils have been adequately drained.

The map units in Champaign County that are prime farmland are:

23A—Blount silt loam, 0 to 2 percent slopes (where drained)
23B—Blount silt loam, 2 to 5 percent slopes (where drained)
27B—Miami silt loam, 2 to 5 percent slopes
56B—Dana silt loam, 2 to 5 percent slopes
67—Harpster silty clay loam (where drained)
73—Ross silt loam
91B—Swygert silty clay loam, 1 to 5 percent slopes
102A—La Hogue loam, 0 to 3 percent slopes
125—Selma loam (where drained)
131B—Alvin sandy loam, 1 to 5 percent slopes
[illegible] silt loam, 1 to 5 percent slopes
149A—Brenton silt loam, 0 to 3 percent slopes
150B—Onarga sandy loam, 1 to 5 percent slopes
152—Drummer silty clay loam (where drained)
153—Pella silty clay loam (where drained)
154A—Flanagan silt loam, 0 to 3 percent slopes
171B—Catlin silt loam, 2 to 7 percent slopes
194B—Morley silt loam, 2 to 5 percent slopes
198A—Elburn silt loam, 0 to 3 percent slopes
199B—Plano silt loam, 1 to 5 percent slopes
206—Thorp silt loam (where drained)
219—Millbrook silt loam (where drained)
221B—Parr silt loam, 2 to 5 percent slopes
223B2—Varna silt loam, 2 to 5 percent slopes, eroded
232—Ashkum silty clay loam (where drained)
233B—Birkbeck silt loam, 1 to 5 percent slopes
234A—Sunbury silt loam, 0 to 3 percent slopes
235—Bryce silty clay (where drained)
236A—Sabina silt loam, 0 to 3 percent slopes (where drained)
242A—Kendall silt loam, 0 to 3 percent slopes (where drained)
243B—St. Charles silt loam, 1 to 5 percent slopes
291B—Xenia silt loam, 2 to 5 percent slopes
302—Ambraw silty clay loam (where drained)
330—Peotone silty clay loam (where drained)
387B—Ockley silt loam, 1 to 5 percent slopes
398A—Wea silt loam, 0 to 3 percent slopes
402—Colo silty clay loam (where drained)
440B—Jasper loam, 1 to 5 percent slopes
448B—Mona silt loam, 2 to 7 percent slopes
[illegible] silt loam, 0 to 2 percent slopes

use and management of the soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, [redacted] yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed soil map units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

About 558,800 acres in Champaign County is [redacted]

reduce the extent of erosion on many soils in the county. No-till is most effective on moderately well drained and well drained soils. Till-plant or ridge-plant systems are more effective on somewhat poorly drained soils.

Soil blowing is a hazard during part of the winter and early in spring. The hazard can be reduced by maintaining a plant cover, leaving crop residue on the surface throughout the winter, or keeping the surface rough. Windbreaks of suitable trees or shrubs also are effective in controlling soil blowing.

Further information about measures that control erosion and soil blowing is provided in the Technical Guide, available in local offices of the Soil Conservation Service.

A drainage system has been installed on about 80

Extension Service can help in determining the kinds and amounts of fertilizer and lime needed.

Soil tilth is an important factor influencing the germination of seeds, the amount of runoff, and the intake of water into the soil. Surface soil that is in good tilth is granular and porous. Poor tilth is a problem in the light colored, clayey Chatsworth soils; the dark colored, clayey Bryce soils; and the sloping Varna soils. These soils often stay wet until late in spring. If plowed when wet, they tend to be very cloddy. As a result, preparing a good seedbed is difficult. Chisel plowing or tilling in the fall generally results in good tilth in the spring if crop residue is left on the surface.

The field crops suited to the soils and climate of the survey area include many that are not commonly grown.

that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability

The capability classification of each map unit is given in the section 'Detailed soil map units."

woodland management and productivity

When the first settlers arrived, virgin forest covered about 7 percent of the acreage in Champaign County. Since then, the trees have been cleared from most of

that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which

soils. The estimates in table 7 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil

the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on the soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that a few trees may be blown down by normal winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

windbreaks and environmental plantings

Conservation Service or the Cooperative Extension Service or from a nursery.

recreation

Only about 1 percent of the acreage in Champaign County is used for recreational purposes. The increasing metropolitan population has placed a burden on the existing recreational facilities. Because of other land uses, such as farming, building site development, and commercial and industrial development, the tracts available for recreational uses commonly are the less desirable ones. Lake of the Woods Park is the busiest recreational area in the county (fig. 16). Other facilities scattered throughout the county include golf courses, playgrounds, athletic fields, swimming pools, and camping and picnic areas.

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for

and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the

Figure 16.—An area of Lake of the Woods Park.

depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking, horseback riding, and bicycling should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

wildlife habitat

Steven J. Brady, biologist, Soil Conservation Service, helped prepare this section.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated

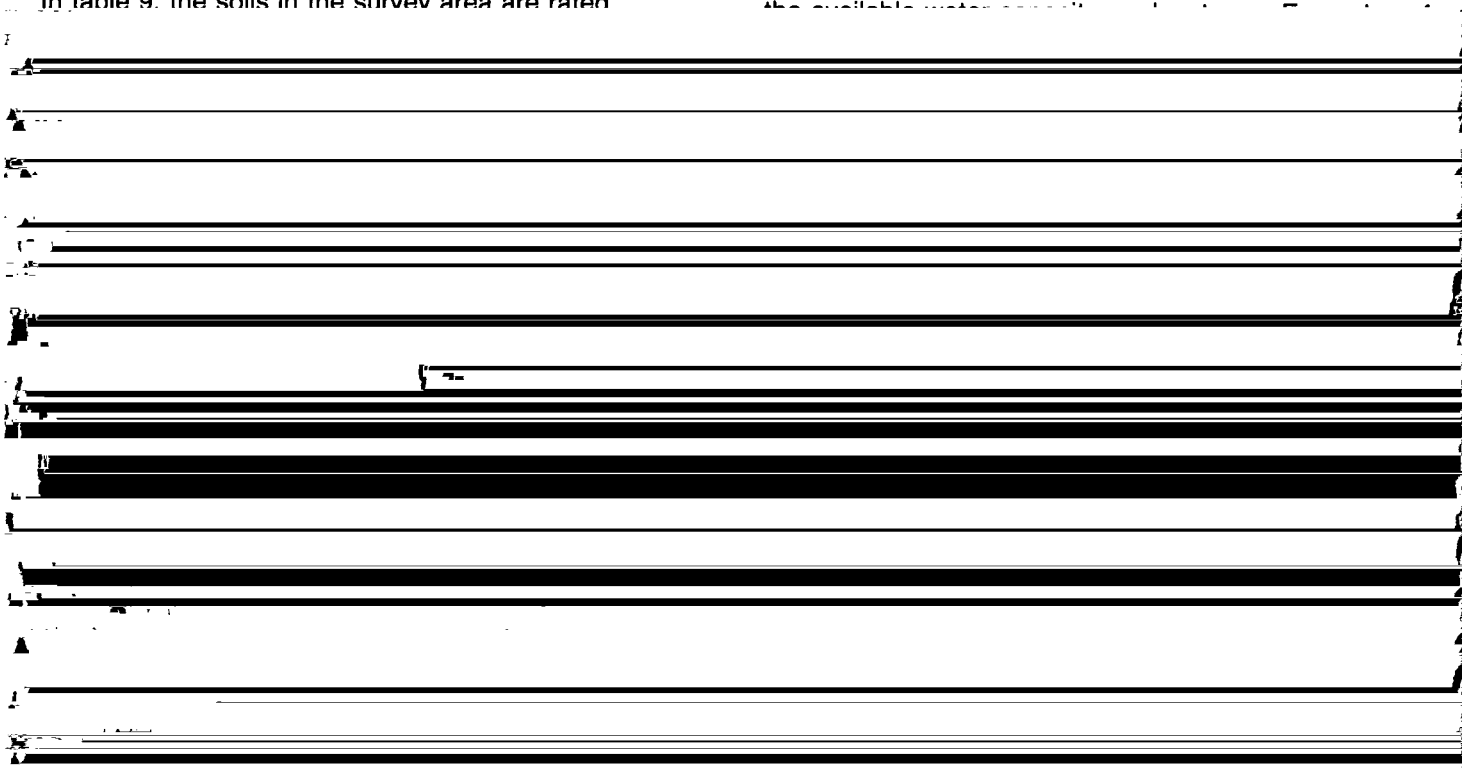
The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, and soybeans.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, ragweed, foxtail, and smartweed.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone,



herbaceous plants. The wildlife attracted to these areas include bobwhite, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, frogs, turtles, and snakes.

The kind and abundance of wildlife in Champaign County reflect the soil types, land use, and vegetation. About 80 percent of the soils originally had a seasonal high water table within 4 feet of the surface, and much

Measures that keep the pastures in good condition, measures that exclude livestock from wooded areas, a system of conservation tillage that leaves crop residue on the surface after planting, and deferment of mowing in grassy areas until August are beneficial. Seeding roadsides, fence rows, and travel lanes to perennial plants, such as smooth bromegrass, alfalfa, and alsike clover, or allowing the perennial native prairie grasses, such as bluestem, switchgrass, and cordgrass, to dominate helps to control undesirable weeds and provides good wildlife cover.

Wildlife Area 2 is on the Drummer-Xenia, Drummer-Kendall-St. Charles, Morley-Blount-Ashkum, and Colo-Ross associations. It does not include areas where a significant part of the acreage is urban land. The soils are nearly level to strongly sloping and range from poorly drained to well drained. Those in the Colo-Ross

management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict

building site development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or

limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after

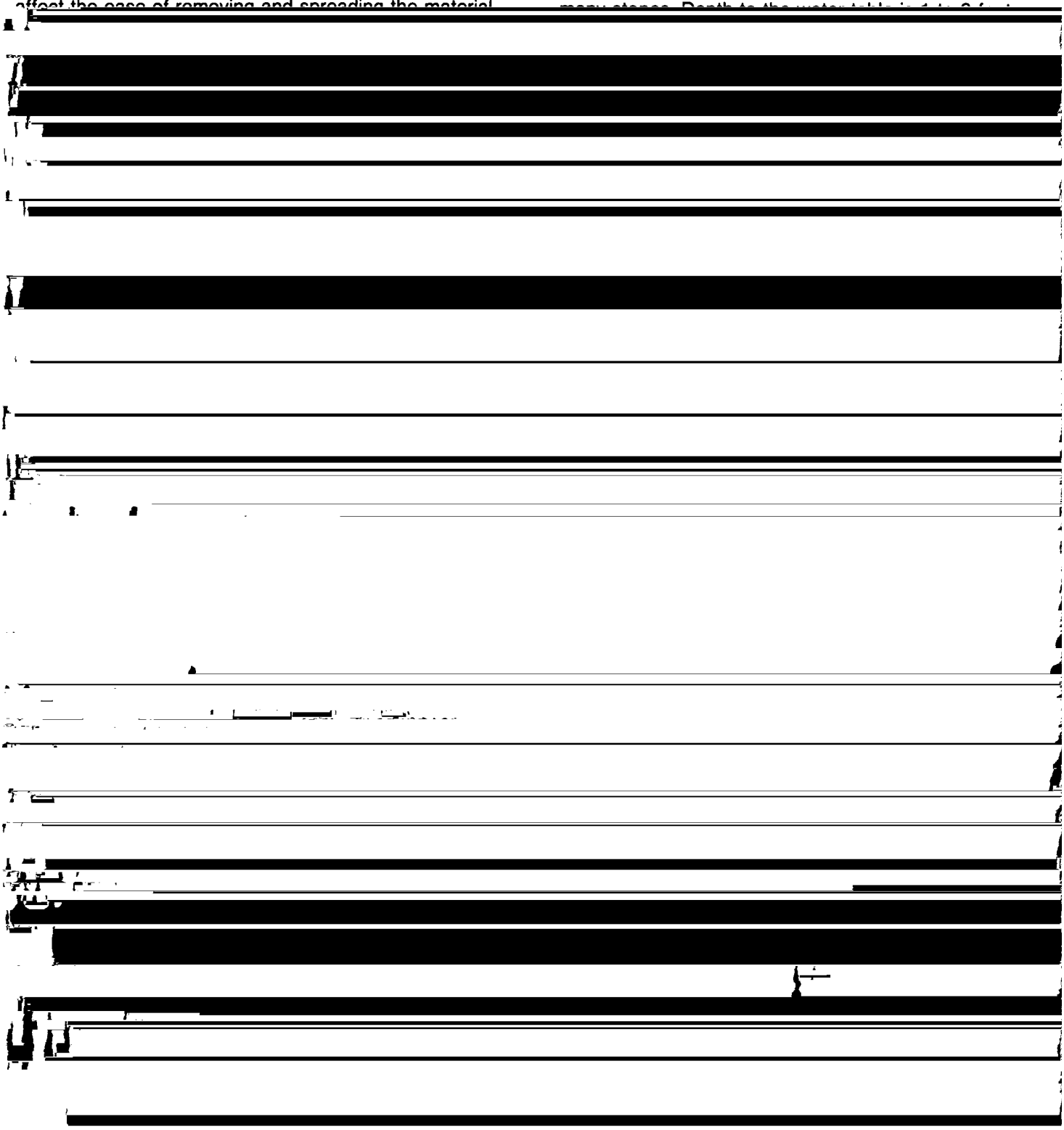
local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while microorganisms decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of

landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material

than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet



Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium.

soil properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to

Classification of the soils is determined according to the Unified soil classification system (*3*) and the system adopted by the American Association of State Highway and Transportation Officials (*2*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils

estimates are based on test data from the survey area or from nearby areas and on field examination.

physical and chemical properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are

capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops

2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are

control soil blowing are used.

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

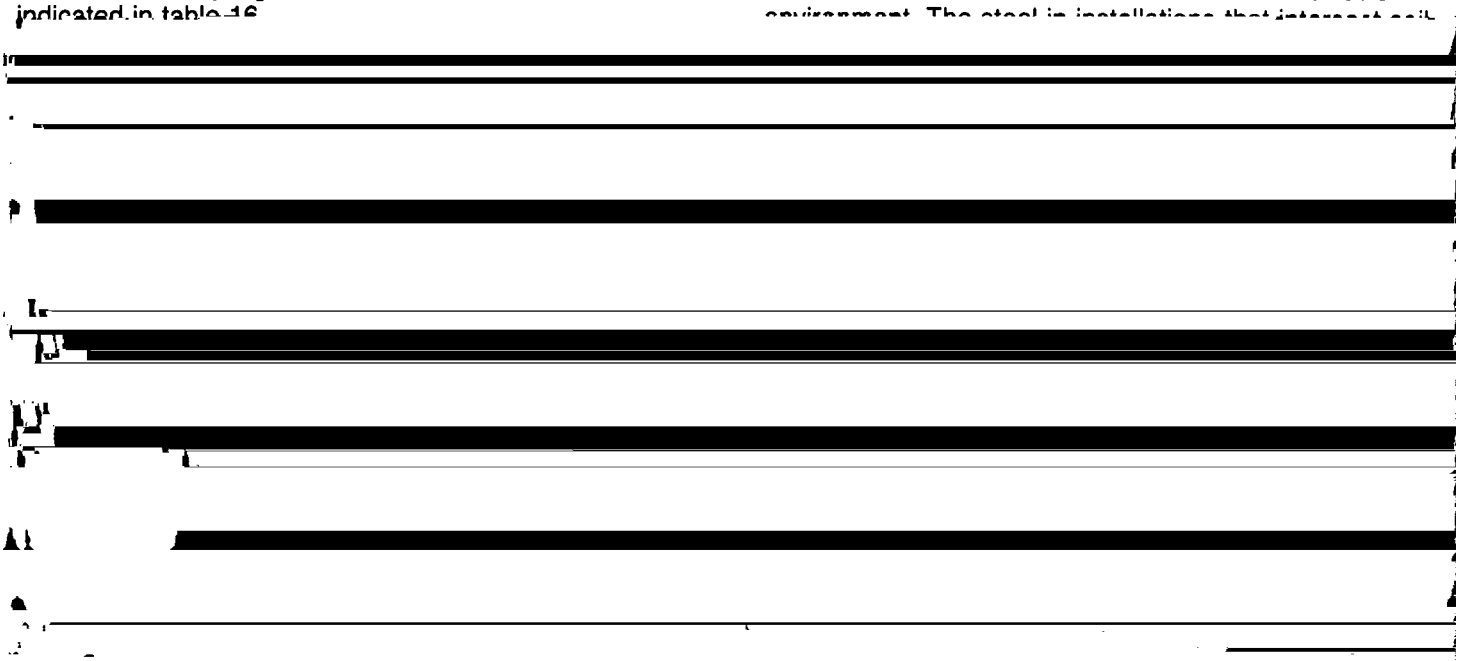
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These

Group D. Soils having a very slow infiltration rate (high

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 16.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil



An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An artesian water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet

boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*10*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 18, the soils of the survey area are classified according to the

there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, mesic Typic Haplaquolls.

SERIES. The series consists of soils that have similar

the somewhat poorly drained La Hogue soils on outwash plains below the Alvin soils.

Typical pedon of Alvin sandy loam, 1 to 5 percent slopes, 165 feet north and 1,220 feet east of the southwest corner of sec. 31, T. 19 N., R. 14 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) sandy loam, pale brown (10YR 6/3) dry; weak fine granular structure; very friable; slightly acid; abrupt smooth boundary.

A21—8 to 12 inches; brown (10YR 5/3) sandy loam, very pale brown (10YR 7/3) dry; weak medium platy structure; very friable; few thin light gray (10YR 7/2) silica coatings on faces of peds; slightly acid; abrupt smooth boundary.

A22—12 to 20 inches; yellowish brown (10YR 5/4) sandy loam, very pale brown (10YR 7/4) dry; weak platy structure parting to weak medium subangular blocky; friable; common thin light gray (10YR 7/2) silica coatings on faces of peds; medium acid; clear smooth boundary.

B1—20 to 30 inches; yellowish brown (10YR 5/4) [illegible]

Ambraw soils commonly are adjacent to the higher lying, well drained Ross soils on slight rises.

Typical pedon of Ambraw silty clay loam, 1,040 feet south and 70 feet east of the northwest corner of sec. 14, T. 22 N., R. 7 E.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure parting to moderate medium granular; friable; gray (10YR 6/1) silt coatings; neutral; clear smooth boundary.

A12—8 to 15 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure parting to moderate medium granular; friable; neutral; clear smooth boundary.

B1g—15 to 21 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; few fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; neutral; clear smooth boundary.

B21g—21 to 30 inches; dark gray (5Y 4/1) loam;

Ashkum soils commonly are adjacent to Elliott and Varna soils. Both of the adjacent soils have an argillic B horizon. The somewhat poorly drained Elliott soils are higher on the landscape than the Ashkum soils. The moderately well drained Varna soils are in the more sloping areas above the Ashkum soils.

Typical pedon of Ashkum silty clay loam, 40 feet north and 2,160 feet east of the southwest corner of sec. 11, T. 22 N., R. 10 E.

[redacted]

Ap—0 to 10 inches; black (N 2/0) silty clay loam, dark gray (10YR 4/1) dry; weak medium angular blocky structure; firm; neutral; abrupt smooth boundary.

A12—10 to 17 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; few fine distinct dark grayish brown (2.5Y 4/2) mottles; moderate medium granular structure; firm; neutral; clear smooth boundary.

B21—17 to 25 inches; dark grayish brown (2.5Y 4/2) silty clay; common medium distinct light olive brown (2.5Y 5/4) and few fine prominent yellowish brown (10YR 5/6) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; [redacted]

ranges from slightly acid to moderately alkaline. The IIC horizon is mildly alkaline or moderately alkaline.

Birkbeck series

The Birkbeck series consists of moderately well drained, moderately permeable soils on the till plains. These soils formed in loess and in the underlying calcareous loamy glacial till. Slopes range from 1 to 5 percent.

Birkbeck soils commonly are adjacent to Drummer, Sabina, and Sunbury soils. The poorly drained Drummer soils are in drainageways and depressions below the Birkbeck soils. They do not have an argillic B horizon and have a mollic epipedon. The somewhat poorly drained Sabina and Sunbury soils are lower on the landscape than the Birkbeck soils. They have a fine textured subsoil. Also, Sunbury soils have a mollic surface layer.

Typical pedon of Birkbeck silt loam, 1 to 5 percent slopes, 900 feet south and 2,370 feet west of the northeast corner of sec. 31, T. 19 N., R. 14 W.

[redacted]

IIC—60 to 70 inches; mottled yellowish brown (10YR 5/4) and pale brown (10YR 6/3) loam; massive; firm; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 44 to 70 inches. The thickness of the overlying loess ranges from 40 to 60 inches.

The A1 or Ap horizon has value of 3 or 4 and chroma of 1 to 3. The A2 horizon has value of 4 or 5 and chroma of 2 to 4. The B2t horizon has value of 4 or 5 and chroma of 3 or 4. It is medium acid or slightly acid. The clay content ranges from 27 to 35 percent in the control section. The IIB horizon has hue of 10YR, 7.5YR, or 2.5Y, value of 4 to 6, and chroma of 2 to 6. It is loam, clay loam, silty clay loam, or silt loam. It ranges from slightly acid to mildly alkaline. The IIC horizon is loam or clay loam.

Blount series

The Blount series consists of somewhat poorly drained, slowly permeable or moderately slowly permeable soils on upland till plains near streams and drainageways. These soils formed in silty clay loam glacial till. Slopes range from 0 to 5 percent.

Blount soils commonly are adjacent to Ashkum and Morley soils. The poorly drained Ashkum soils are in drainageways and depressions below the Blount soils. They have a mollic epipedon and do not have an argillic B horizon. The moderately well drained Morley soils

structure; firm; continuous moderately thick grayish brown (2.5Y 5/2) clay films on faces of peds; few medium black accumulations (iron and manganese oxide); very strongly acid; clear smooth boundary.

B23tg—23 to 32 inches; grayish brown (10YR 5/2) silty clay; many coarse distinct yellowish brown (10YR 5/6) and common coarse distinct dark yellowish brown (10YR 4/4) mottles; moderate medium prismatic structure; firm; continuous moderately thick gray (N 5/0) clay films on faces of peds; common medium black accumulations (iron and manganese oxide); slightly acid; clear smooth boundary.

B3t—32 to 40 inches; mottled silty clay, 60 percent yellowish brown (10YR 5/6) and 40 percent gray (10YR 6/1); moderate coarse prismatic structure; firm; common moderately thick very dark gray (10YR 3/1) and common thin dark gray (10YR 4/1) clay films lining pores; neutral; clear smooth boundary.

C—40 to 60 inches; yellowish brown (10YR 5/4) silty clay loam; common coarse distinct gray (N 6/0) mottles; massive; firm; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 45 inches. The depth to free carbonates ranges from 20 to 40 inches.

The Ap horizon has chroma of 1 or 2. The A2 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. The B2t horizon has hue of 10YR or 2.5Y, value

A3—10 to 16 inches; very dark gray (10YR 3/1) silt [redacted] colluvial material over silty clay glacial till. Slopes range [redacted]

percent. The Cg horizon is silty clay loam or silty clay. It is mildly alkaline or moderately alkaline.

Camden series

The Camden series consists of well drained, moderately permeable soils on outwash plains and stream terraces. These soils formed in loess and in the underlying stratified, medium textured glacial outwash. Slopes range from 1 to 5 percent.

Camden soils commonly are adjacent to Drummer and Kendall soils. The poorly drained Drummer soils are in drainageways and depressions below the Camden soils. They have a mollic epipedon and do not have an argillic B horizon. The somewhat poorly drained Kendall soils are lower on the landscape than the Camden soils. Also, more of their subsoil formed in loess.

Typical pedon of Camden silt loam, 1 to 5 percent slopes, 100 feet west and 30 feet north of the southeast corner of sec. 6, T. 22 N., R. 14 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and very fine granular structure; friable; neutral; abrupt smooth boundary.

A2—9 to 14 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 7/2) dry; moderate thin platy structure; friable; few thin light brownish gray (10YR 6/2) silt coatings on faces of peds; neutral; abrupt smooth boundary.

B1t—14 to 18 inches; yellowish brown (10YR 5/4) silt loam; moderate very fine subangular blocky structure; friable; many thin brown (10YR 4/3) clay films and few thin light brownish gray (10YR 6/2) silt coatings on faces of peds; neutral; clear smooth boundary.

B2t—18 to 30 inches; yellowish brown (10YR 5/4) silt loam; moderate fine subangular blocky structure; friable; common thin brown (10YR 4/3) clay films on faces of peds; common fine and medium irregular dark accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

IIB3—52 to 62 inches; mixed brown (10YR 4/3) and yellowish brown (10YR 5/4) sandy loam; few fine faint brown (10YR 5/3) mottles; weak coarse prismatic structure; friable; few thin brown (10YR 4/3) clay films as bridges across sand grains; few fine rounded dark accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

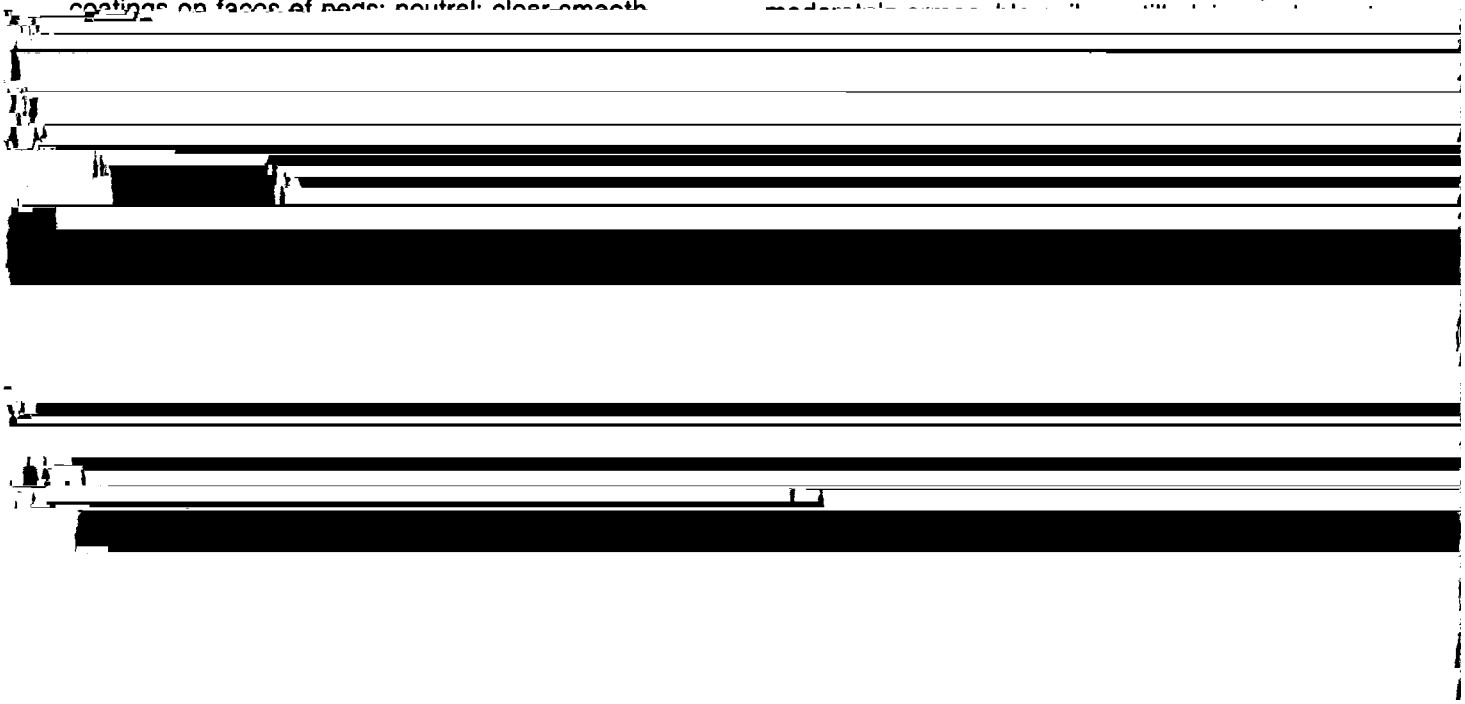
IIC—62 to 77 inches; yellowish brown (10YR 5/4 and 5/6) stratified sandy loam, loam, and sandy clay loam; massive; very friable; medium acid.

The thickness of the solum ranges from 40 to 65 inches. The thickness of the overlying silty material ranges from 24 to 40 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The A2 horizon has value of 4 to 6 and chroma of 2 to 4. The Bt and IIB horizons have hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. The clay content ranges from 27 to 35 percent in the control section. The Bt horizon ranges from strongly acid to neutral. The IIB horizon is clay loam, sandy loam, or silt loam. It ranges from medium acid to neutral. The IIC horizon is dominantly stratified loam, sandy loam, and silt loam but has thin strata of other textures. It ranges from medium acid to moderately alkaline.

Catlin series

The Catlin series consists of moderately well drained,



grayish brown (10YR 3/2) organic films on faces of peds; neutral; clear smooth boundary.

B21t—15 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; many thin very dark grayish brown (10YR 3/2) clay films; medium acid; clear smooth boundary.

B22t—22 to 30 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct strong brown (7.5YR 4/6) mottles; moderate fine and medium subangular blocky structure; friable; many thin brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

B23t—30 to 45 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine faint light brownish gray (10YR 6/2) and few fine distinct strong brown (7.5YR 4/6) mottles; weak coarse subangular blocky structure; friable; many thin brown (10YR 4/3) clay films on faces of peds; common thick very dark grayish brown (10YR 3/2) root channel fillings; common thin irregular dark accumulations (iron and manganese oxide); slightly acid; clear wavy boundary.

landscape than the Chatsworth soils. They have a mollic epipedon. Also, Swygert soils have an argillic B horizon.

Typical pedon of Chatsworth silty clay, 7 to 15 percent slopes, 2,425 feet south and 30 feet west of the northeast corner of sec. 5, T. 22 N., R. 9 E.

Ap—0 to 8 inches; dark grayish brown (2.5Y 4/2) silty clay, light brownish gray (2.5Y 6/2) dry; weak fine angular blocky structure; firm; common thin very dark grayish brown (2.5Y 3/2) organic films on faces of peds; common granite pebbles and shale flakes; slight effervescence; mildly alkaline; abrupt smooth boundary.

B2tg—8 to 19 inches; mottled olive gray (5Y 5/2) and olive (5Y 5/3) silty clay; common fine faint gray (5Y 5/1) mottles; strong medium angular blocky structure; very firm; few thin dark gray (5Y 4/1) clay films on faces of peds; common granite pebbles and shale flakes; strong effervescence; moderately alkaline; clear smooth boundary.

Cg—19 to 60 inches; mottled gray (5Y 5/1), olive gray (5Y 5/2), and olive (5Y 5/3) silty clay; moderate coarse angular blocky pressure faces in the upper

silt coatings on faces of peds; neutral; clear smooth boundary.

A12—9 to 23 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; few fine prominent strong brown (7.5YR 4/6) mottles; weak medium subangular blocky structure parting to moderate medium granular; friable; neutral; gradual smooth boundary.

A13—23 to 38 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; common fine prominent strong brown (7.5YR 4/6) mottles; moderate fine and medium angular and subangular blocky structure; friable; neutral; gradual smooth boundary.

B2—38 to 50 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; common fine prominent olive (5Y 5/3) and few coarse prominent strong brown (7.5YR 4/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; neutral; gradual smooth boundary.

Cg—50 to 68 inches; mottled clay loam, 20 percent dark

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam; weak medium subangular blocky structure; friable; neutral; abrupt smooth boundary.

A12—9 to 12 inches; very dark grayish brown (10YR 3/2) silt loam; moderate medium granular structure; friable; neutral; clear smooth boundary.

B21t—12 to 18 inches; brown (10YR 4/3) silty clay loam; moderate fine and very fine subangular blocky structure; friable; common thin very dark grayish brown (10YR 3/2) organic films on faces of peds; slightly acid; clear smooth boundary.

B22t—18 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; common fine faint grayish brown (10YR 5/2) and common medium faint yellowish brown (10YR 5/6) mottles in the lower part; weak medium prismatic structure parting to moderate medium subangular blocky; friable; continuous thin brown (10YR 4/3) clay films on faces of peds; few fine irregular black accumulations (iron and manganese oxide); slightly acid; clear smooth boundary.

B23t—27 to 34 inches; yellowish brown (10YR 5/4) silty

the control section. The IIB horizon is slightly acid or neutral.

mottles; weak medium prismatic structure parting to weak medium angular blocky; firm; few fine roots;

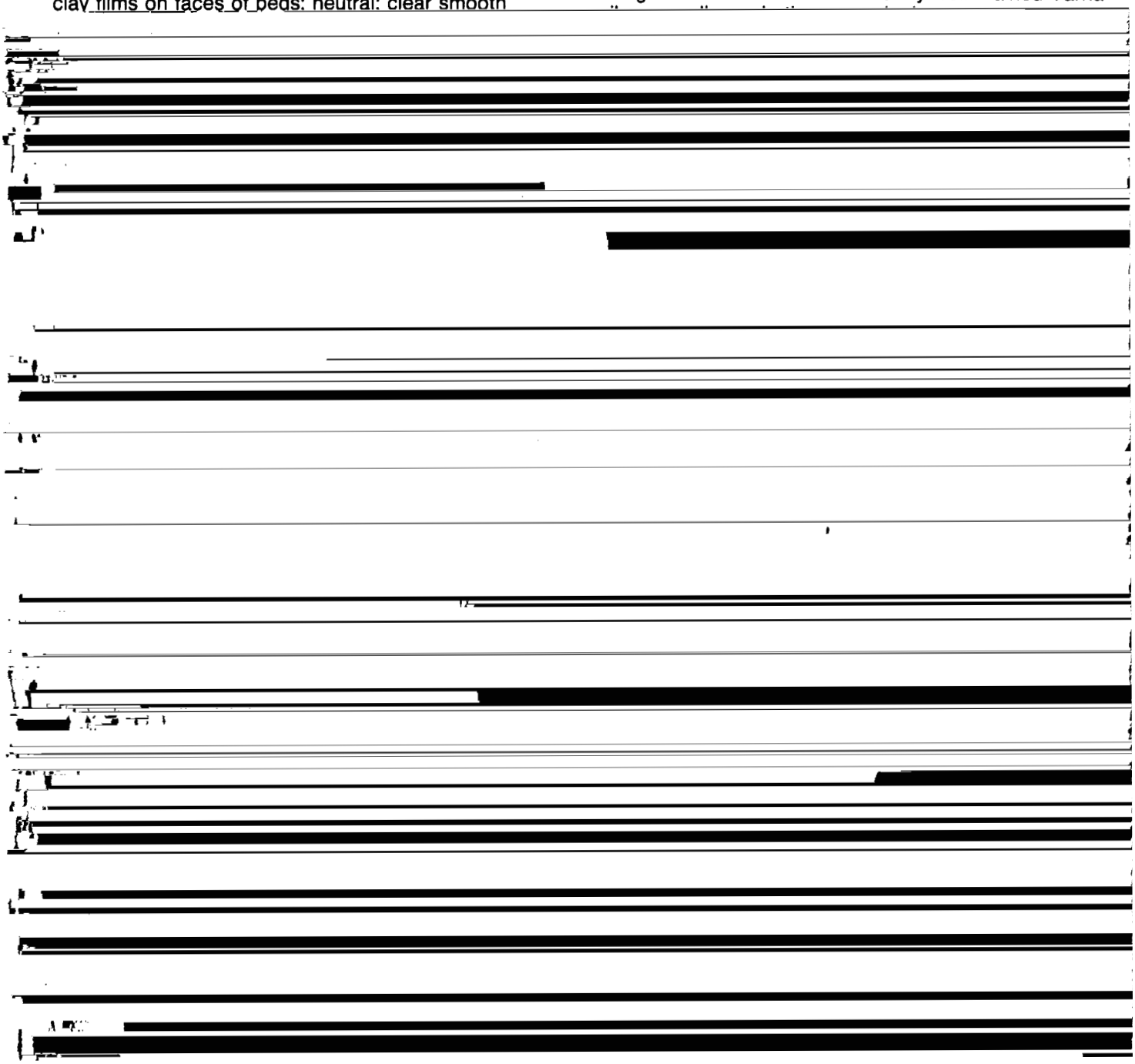
subangular blocky structure parting to moderate medium granular; friable; brown (10YR 4/3) flecks of subsoil material in the lower part; slightly acid; abrupt smooth boundary.

B21t—16 to 24 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) mottles; moderate fine prismatic structure parting to moderate fine and very fine subangular blocky; firm; common thin very dark gray (10YR 3/1) and continuous thin dark grayish brown (10YR 4/2) clay films on faces of peds; neutral; clear smooth

Elliott series

The Elliott series consists of somewhat poorly drained, moderately slowly permeable soils on till plains and moraines. These soils formed in a thin layer of loess and in the underlying silty clay loam glacial till. Slopes range from 1 to 5 percent.

Elliott soils commonly are adjacent to Ashkum and Varna soils. The poorly drained Ashkum soils are in drainageways below the Elliott soils. They do not have an argillic B horizon. The moderately well drained Varna



IIB3 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 to 6. It ranges from slightly acid to mildly alkaline. The IIC horizon is silty clay loam, clay loam, or silt loam. It is mildly alkaline or moderately alkaline.

Flanagan series

The Flanagan series consists of somewhat poorly drained, moderately slowly permeable soils on till plains and moraines. These soils formed in loess and in the underlying loamy glacial till. Slopes range from 0 to 3 percent.

Flanagan soils commonly are adjacent to Catlin, Dana, and Drummer soils. The moderately well drained Catlin

(10YR 3/2) coatings on faces of peds; slightly acid; clear smooth boundary.

B31t—38 to 45 inches; mottled yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and brown (10YR 5/3) silt loam; weak medium subangular blocky structure; friable; discontinuous thin very dark grayish brown (10YR 3/2) coatings on faces of peds; neutral; gradual smooth boundary.

IIB32t—45 to 49 inches; mottled yellowish brown (10YR 5/4), light olive brown (2.5Y 5/4), and light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; firm; patchy thin dark grayish brown (10YR 4/2) clay films on faces of peds; about 5 percent pebbles; neutral; abrupt smooth boundary.

IIC—49 to 60 inches; yellowish brown (10YR 5/4) loam;

5/6) mottles; moderate medium subangular blocky structure; friable; many thin very dark gray (10YR 3/1) organic films on faces of peds; violent effervescence; moderately alkaline; clear smooth boundary.

B21g—17 to 28 inches; gray (5Y 5/1) silty clay loam; [redacted]

drained Brenton soils and the poorly drained Drummer soils are lower on the landscape than the Jasper soils and contain less sand in the control section. Also, Drummer soils do not have an argillic B horizon. The somewhat poorly drained La Hogue soils are on foot slopes below the Jasper soils.

[redacted]

Kendall series

The Kendall series consists of somewhat poorly drained, moderately permeable soils on outwash plains. These soils formed in loess and in the underlying stratified, loamy outwash. Slopes range from 0 to 3 percent.

Kendall soils commonly are adjacent to Camden, Drummer, and St. Charles soils. The well drained Camden soils are higher on the landscape than the Kendall soils. Also, they have a thinner loess cap. The poorly drained Drummer soils are in drainageways and depressions below the Kendall soils. They have a mollic epipedon and do not have an argillic B horizon. The

sandy loam; massive; friable; few fine irregular iron and manganese concretions; slightly acid.

The thickness of the solum ranges from 45 to 70 inches. The thickness of the overlying silty material ranges from 40 to 60 inches.

The Ap horizon has value of 4 or 5 and chroma of 1 or 2. The A2 horizon has value of 4 to 7 and chroma of 2 or 3. The B1 horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6. It ranges from strongly acid to slightly acid. The B2t horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 to 6. It ranges from very strongly acid to neutral. The clay content in

peds; few thin dark accumulations (iron and manganese oxide); neutral; clear smooth boundary.

B3t—36 to 43 inches; brown (10YR 4/3) sandy loam; common medium prominent reddish brown (5YR 4/4) and common medium distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; friable; patchy thin dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular dark accumulations (iron and manganese oxide); neutral; gradual smooth boundary.

C1—43 to 54 inches; mottled grayish brown (10YR 5/2) and strong brown (7.5YR 5/6) sandy loam; common medium distinct reddish brown (5YR 4/4) mottles; massive; very friable; common medium irregular dark

drainageways and depressions. They do not have an argillic B horizon. Kendall soils are somewhat poorly drained.

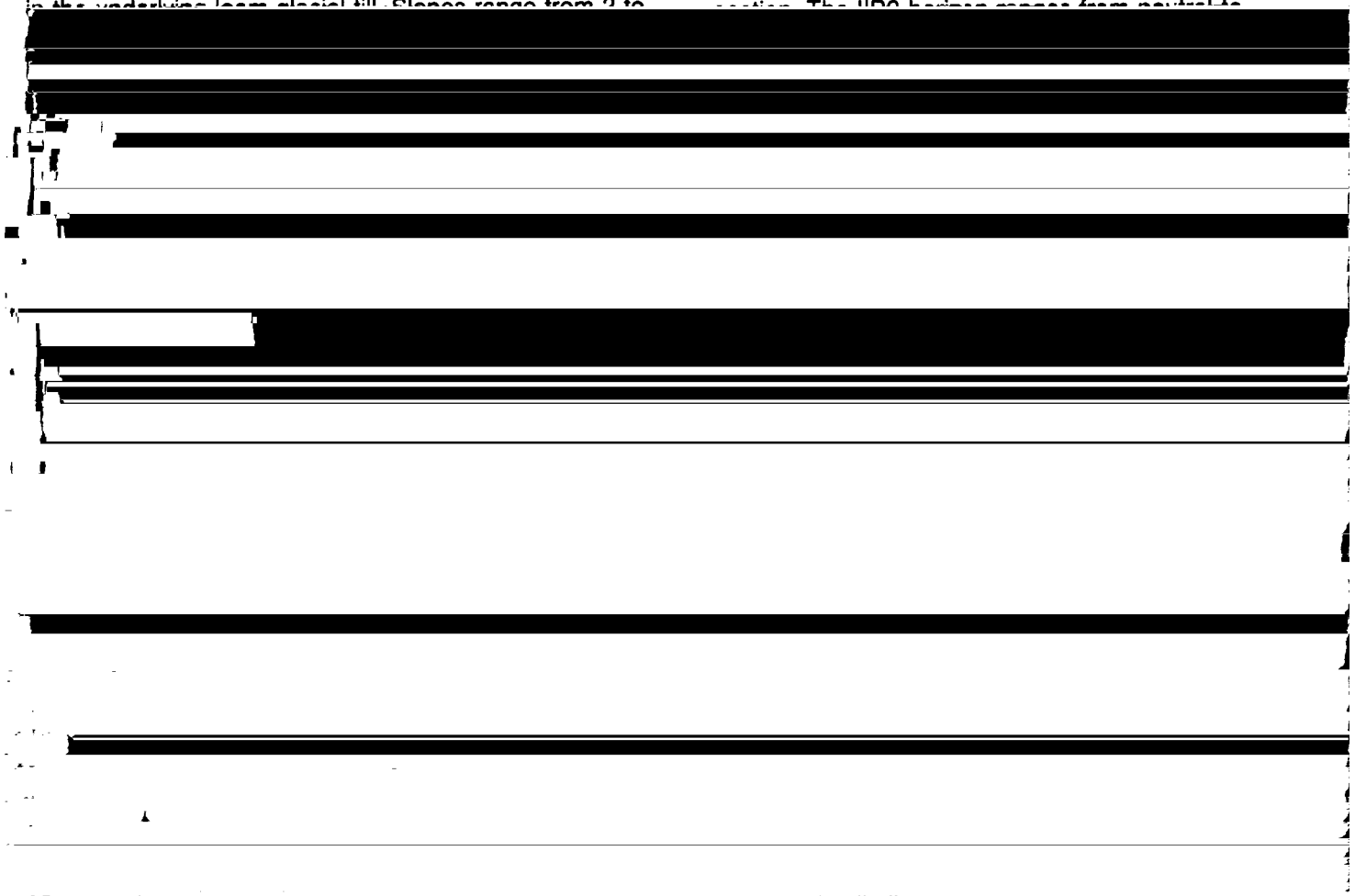
Typical pedon of Martinsville silt loam, 2 to 5 percent slopes, 200 feet north and 2,440 feet west of the center of sec. 36, T. 21 N., R. 7 E.

Ap—0 to 6 inches; mixed dark grayish brown (10YR 4/2) and yellowish brown (10YR 5/4) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; slightly acid; abrupt smooth boundary.

A2—6 to 9 inches; brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; weak medium platy

Miami series

The Miami series consists of well drained soils that are moderately permeable in the solum and moderately slowly permeable in the underlying material. These soils are on uplands. They formed in a thin layer of loess and in the underlying loam glacial till. Slopes range from 2 to



25 percent.

Miami soils commonly are adjacent to Ambraw, Colo, Drummer, and Xenia soils. The poorly drained Ambraw and Colo soils are on alluvial bottom land below the Miami soils. The poorly drained Drummer soils are in drainageways and depressions below the Miami soils. They do not have an argillic B horizon. The moderately well drained Xenia soils generally are lower on the landscape than the Miami soils. Also, they formed in a thicker layer of loess and in the underlying loam glacial till.

Typical pedon of Miami silt loam, 5 to 10 percent slopes, eroded, 50 feet south and 600 feet east of the center of sec. 31, T. 21 N., R. 8 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium platy structure parting to moderate medium subangular blocky; friable; silt coatings on faces of

A2 horizon. This horizon has value of 4 to 6 and chroma of 2 to 4. It is silt loam or loam. The IIB2t horizon has hue of l0YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is clay loam, loam, sandy clay loam, or silty clay loam. It ranges from medium acid to neutral. The clay content ranges from 25 to 35 percent in the control

moderately alkaline.

Millbrook series

The Millbrook series consists of somewhat poorly drained, moderately permeable soils on outwash plains. These soils formed in loess and in the underlying loamy outwash. Slopes range from 0 to 2 percent.

Millbrook soils commonly are adjacent to Camden, Drummer, and Proctor soils. The well drained Camden and moderately well drained Proctor soils are higher on the landscape than the Millbrook soils. Also, Proctor soils have a mollic epipedon. The poorly drained Drummer soils are in drainageways and depressions below the Millbrook soils. They have a mollic epipedon and do not have an argillic B horizon.

Typical pedon of Millbrook silt loam, 55 feet north and 2,240 feet west of the southeast corner of sec. 36, T. 17 N., R. 9 E.

mottles; moderate medium prismatic structure; friable; few fine dark gray (10YR 4/1) and very dark gray (10YR 3/1) clay films lining pores; few medium irregular dark accumulations (iron and manganese oxide); slightly acid; clear smooth boundary.

IIB3—44 to 55 inches; mottled gray (10YR 5/1) and yellowish brown (10YR 5/4) stratified clay loam and sandy loam; common medium prominent yellowish brown (10YR 5/8) mottles; massive; friable; neutral; clear smooth boundary.

IIC—55 to 60 inches; mottled gray (10YR 5/1) and yellowish brown (10YR 5/4) stratified sandy loam that has thin lenses of coarse sand; massive; very friable; neutral.

The thickness of the solum ranges from 40 to 60 inches. The thickness of the overlying silty material ranges from 22 to 40 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 to 3. The A2 horizon has value of 4 to 6. The B2t horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 6. It ranges from strongly acid to neutral. The content of clay in the control section ranges from 27 to 35 percent. The IIB2t and IIB3 horizons have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 8. They are clay loam, sandy clay loam, loam, sandy loam, sand, or silt loam. The IIB2t horizon ranges from medium acid to mildly alkaline. The IIC horizon is stratified silt loam, loam, sandy loam, clay loam, loamy sand, or sand.

Mona series

The Mona series consists of moderately well drained, moderately slowly permeable soils on upland ridges and knolls. These soils formed in loess and loamy glacial debris and in the underlying clayey glacial till (fig. 17). Slopes range from 2 to 7 percent.

Mona soils commonly are adjacent to Bryce and Swygert soils. The control section of both of the adjacent soils contains more clay than that of the Mona soils. The poorly drained Bryce soils are in drainageways and depressions below the Mona soils. The somewhat poorly drained Swygert soils generally are lower on the landscape than the Mona soils.

Typical pedon of Mona silt loam, 2 to 7 percent slopes, 650 feet north and 30 feet east of the southwest corner of sec. 9, T. 22 N., R. 9 E.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; moderate fine granular structure; friable; neutral; abrupt smooth boundary.

A3—10 to 15 inches; dark brown (10YR 3/3) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; continuous moderately thick very dark grayish brown (10YR 3/2) organic films on faces of peds; neutral; clear smooth boundary.

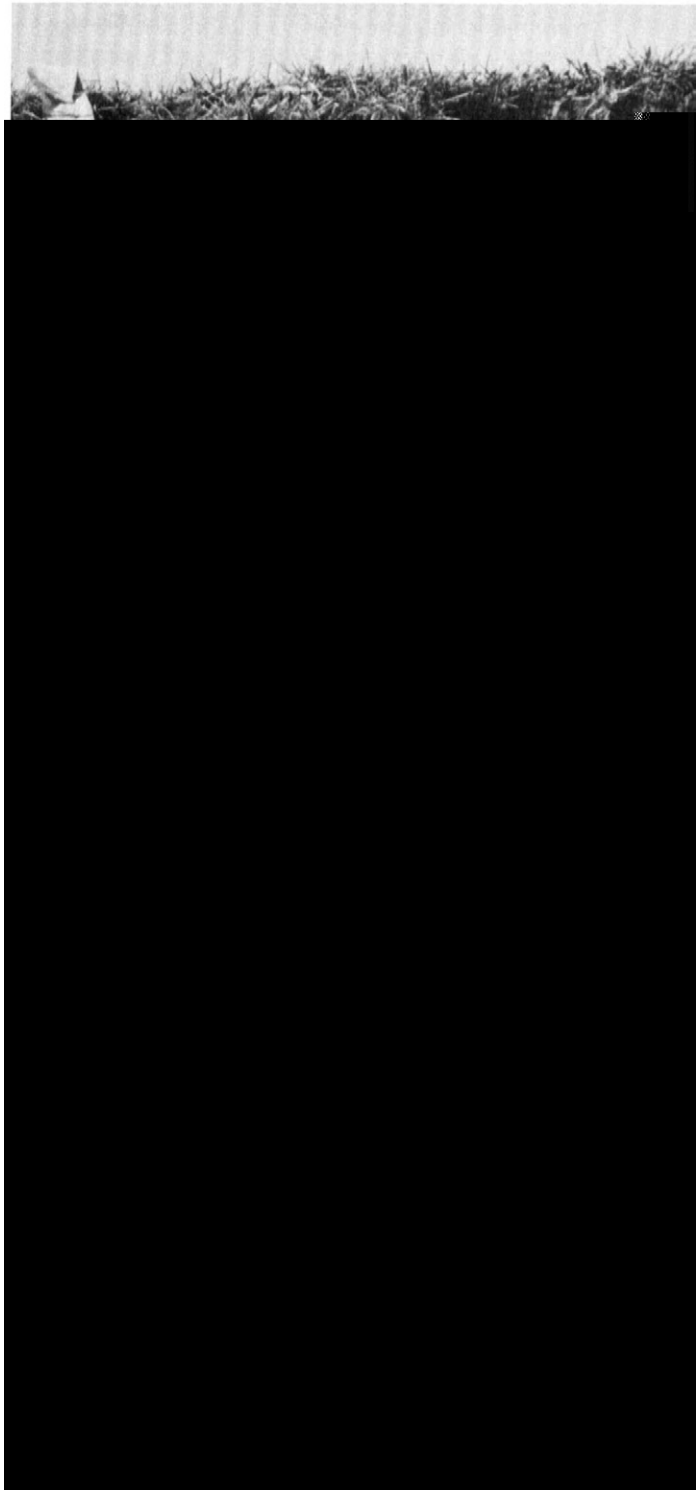


Figure 17.—Profile of Mona silt loam. Dense clayey till is at a depth of about 4 feet.

B21t—15 to 24 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; common thin very dark grayish brown (10YR 3/2) organic films on faces of peds; many thin brown (10YR 4/3) clay films on faces of peds; slightly acid; abrupt smooth boundary.

IIB22t—24 to 35 inches; dark yellowish brown (10YR 4/4) clay loam; few coarse distinct brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable; many thin dark grayish brown (10YR 4/2) clay films on faces of peds; common thin dark yellowish brown (10YR 3/4) clay films lining pores; neutral; clear smooth boundary.

IIB23t—35 to 44 inches; dark yellowish brown (10YR 4/4) sandy clay loam; few coarse distinct brownish yellow (10YR 6/8) mottles; weak coarse subangular blocky structure; friable; many thin dark brown (10YR 3/3) clay films on faces of peds; neutral; abrupt smooth boundary.

IIIB3t—44 to 53 inches; light olive brown (2.5Y 5/4) silty clay; moderate medium prismatic structure; firm; many thin dark grayish brown (2.5Y 4/2) clay films on faces of peds; slight effervescence; mildly alkaline; clear smooth boundary.

IIIC—53 to 60 inches; light olive brown (2.5Y 5/4) silty clay; few medium distinct light brownish gray (2.5Y 6/2) mottles; massive; firm; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 36 to 54 inches. The depth to carbonates ranges from 30 to 50 inches. The thickness of the overlying silty material ranges from 10 to 24 inches. The thickness of the mollic epipedon ranges from 10 to 15 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The B and IIB horizons have value of 4 to 6 and chroma of 3 or 4. They range from medium acid to neutral. The content of clay in the control section ranges from 27 to 35 percent. The IIIB horizon has hue of

Typical pedon of Morley silt loam, 5 to 12 percent slopes, eroded, 1,040 feet south and 2,330 feet west of the northeast corner of sec. 8, T. 22 N., R. 14 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; moderate fine granular structure; friable; neutral; abrupt smooth boundary.

B21t—6 to 10 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; firm; many moderately thick yellowish brown (10YR 5/4) clay films on faces of peds; medium acid; clear smooth boundary.

B22t—10 to 20 inches; light olive brown (2.5Y 5/4) silty clay; common fine distinct yellowish brown (10YR 5/6) mottles; strong medium subangular blocky structure; firm; many moderately thick light olive brown (2.5Y 5/4) clay films on faces of peds; medium acid; clear smooth boundary.

B3t—20 to 34 inches; light olive brown (2.5Y 5/4) silty clay loam; common fine distinct light brownish gray (2.5Y 6/2) and yellowish brown (10YR 5/6) mottles; moderate coarse angular blocky structure; firm; many moderately thick dark grayish brown (2.5Y 4/2) clay films on faces of peds; mildly alkaline; gradual smooth boundary.

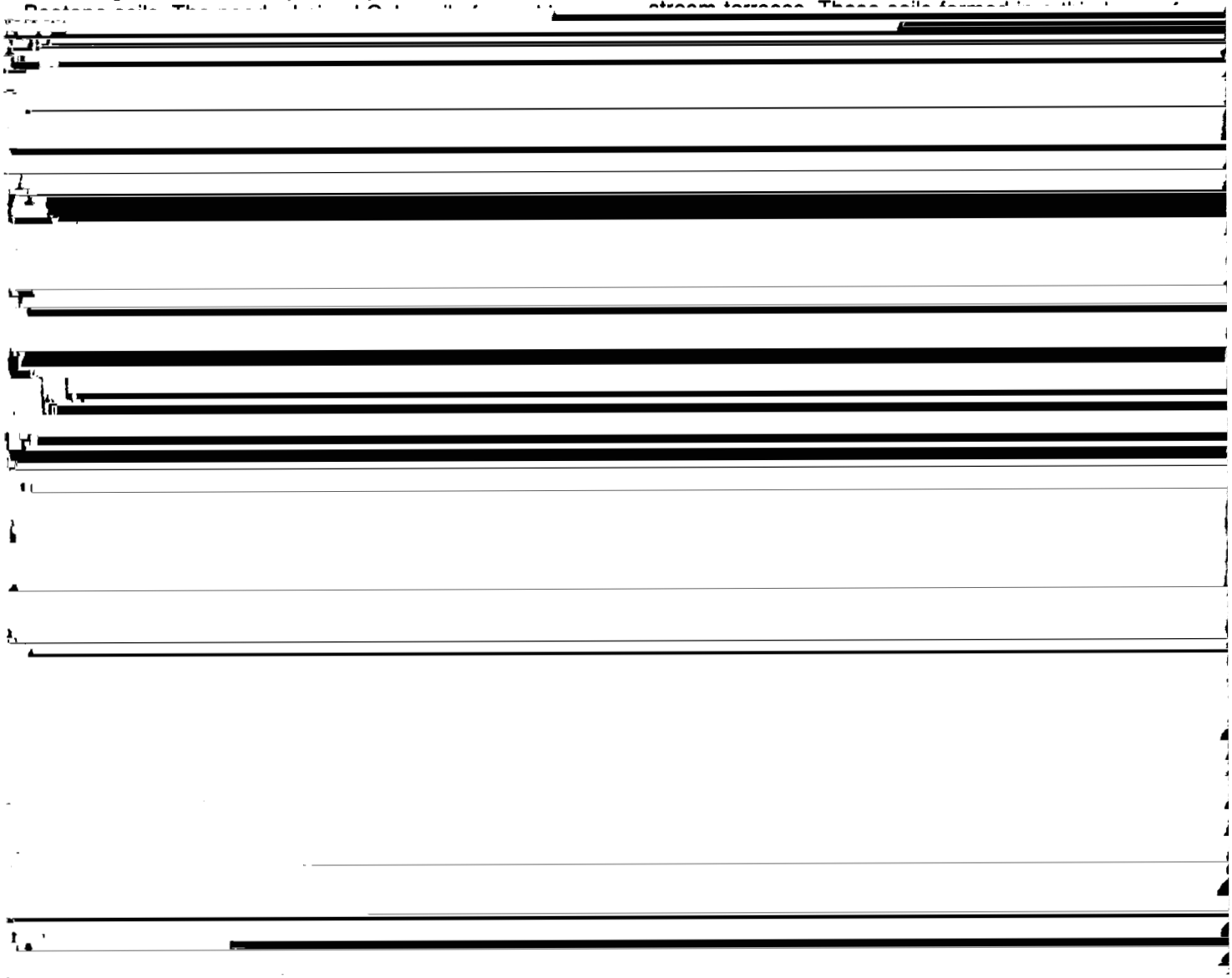
C—34 to 60 inches; light olive brown (2.5Y 5/4) silty clay loam; common medium distinct light brownish gray (2.5Y 6/2) and common fine distinct yellowish brown (10YR 5/6) mottles; massive; very firm; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 48 inches. The depth to free carbonates ranges from 12 to 45 inches.

The Ap horizon has value of 2 to 4 and chroma of 1 or 2. The B2t horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is silty clay loam, clay

profile and slow in the lower part. Slopes range from 0 to 2 percent.

Muskego soils commonly are adjacent to Colo and



medium textured alluvial sediments on bottom land. Peotone soils are cumulic and have a fine textured mineral B2 horizon.

Typical pedon of Muskego silty clay loam, overwash, 1 foot south and 1 foot west of the northeast corner of sec. 18, T. 22 N., R. 14 W.

Ap—0 to 11 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; few fine distinct brown (10YR 4/3) and few fine prominent reddish brown (5YR 4/3) mottles; massive; firm; slightly acid; clear smooth boundary.

A12—11 to 16 inches; black (N 2/0) silty clay loam, very dark gray (10YR 3/1) dry; few fine prominent dark

Ockley series

The Ockley series consists of well drained soils on

loess and in loamy outwash over sand and gravel. Permeability is moderate in the solum and very rapid in the underlying material. Slopes range from 1 to 12 percent.

Ockley soils commonly are adjacent to Blount and Colo soils. The somewhat poorly drained Blount soils are in positions on the landscape similar to those of the Ockley soils. They have a fine textured B horizon. The poorly drained Colo soils are on bottom land below the Ockley soils. They are cumulic and do not have an argillic B horizon.

Typical pedon of Ockley silt loam, 1 to 5 percent slopes, 2,490 feet south and 80 feet east of the

C—49 to 65 inches; yellowish brown (10YR 5/4) sand; bands of brown (7.5YR 4/4) loamy sand 1 to 2 inches thick; massive in lamellae and single grain between; very friable in lamellae and loose between; medium acid.

The thickness of the solum ranges from 36 to 50 inches. The thickness of the mollic epipedon ranges from 12 to 20 inches.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The B horizon is medium acid to neutral. The B1 horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 6. It is sandy loam or sandy clay loam. The B2t and B3 horizons have hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. The B2t horizon is loam, sandy loam, or sandy clay loam. The clay content

C—31 to 60 inches; light olive brown (2.5Y 5/4) loam; few coarse distinct yellowish brown (10YR 5/6) mottles; massive; friable; strong effervescence; common light gray (10YR 7/1) secondary lime accumulations; moderately alkaline.

The thickness of the solum ranges from 24 to 40 inches. The A horizon has value of 2 or 3 and chroma of 1 to 3. It is silt loam, clay loam, or loam. The B2t horizon has value of 3 to 5 and chroma of 3 to 6. It is clay loam or loam. It is medium acid to slightly acid. The C horizon is mildly alkaline or moderately alkaline.

Parr clay loam, 10 to 15 percent slopes, severely eroded, has a thinner surface layer and solum than is defined as the range for the Parr series. This difference, however, does not significantly affect the use or behavior

B3 horizon is sandy loam or loamy sand. The C horizon

common thin dark gray (10YR 4/1) clay films lining pores; common medium rounded lime concretions; strong effervescence; moderately alkaline; clear smooth boundary.

IIB32g—26 to 34 inches; gray (5Y 6/1) silt loam that has noticeable sand; few medium prominent brownish yellow (10YR 6/6) mottles; weak coarse subangular blocky structure; friable; common thin gray (10YR 5/1) clay films on faces of peds; strong effervescence; moderately alkaline; clear smooth boundary.

IICg—34 to 60 inches; gray (5Y 6/1) stratified silt loam and loamy sand; few medium prominent brownish yellow (10YR 6/6) mottles; massive; friable; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 30 to 50 inches. The thickness of the overlying silty material ranges from 24 to 40 inches. The depth to free carbonates ranges from 20 to 40 inches. The mollic epipedon ranges from 12 to 24 inches in thickness.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is typically silty clay loam but is silt loam in some pedons. The B2 horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. The IIB3 horizon has hue of 5Y, 2.5Y, or 10YR, value of 5 or 6, and chroma of 1 to 8. It is silt loam, loam, sandy loam, or silty clay loam. The IIB3 and IIC horizons are mildly alkaline or moderately alkaline.

Peotone series

The Peotone series consists of very poorly drained, moderately slowly permeable soils in depressions in outwash plains and till plains. These soils formed in outwash and in the underlying silty clay loam sediments. Slopes range from 0 to 2 percent.

Peotone soils commonly are adjacent to Brenton, Elliott, Parr, and Varna soils. All of the adjacent soils are better drained than the Peotone soils and are higher on the landscape. Also, their mollic epipedon is less than 24 inches thick.

Typical pedon of Peotone silty clay loam, 105 feet north and 638 feet west of the southeast corner of sec. 7, T. 22 N., R. 9 E.

Ap—0 to 10 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak medium angular blocky structure; firm; neutral; abrupt smooth boundary.

A12—10 to 24 inches; black (N 2/0) silty clay loam, very dark gray (N 3/0) dry; weak fine prismatic structure; 5/1) mottles; weak medium prismatic structure; firm; neutral; clear smooth boundary.

B2g—32 to 46 inches; dark gray (5Y 4/1) silty clay loam; common medium faint gray (5Y 5/1) mottles; weak medium prismatic structure; firm; continuous moderately thick very dark gray (10YR 3/1) organic films on faces of peds; mildly alkaline; clear smooth boundary.

B3g—46 to 60 inches; gray (5Y 5/1) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure; firm; common moderately thick very dark gray (10YR 3/1) clay films on faces of peds; common thin dark gray (10YR 4/1) films on faces of peds; mildly alkaline; gradual smooth boundary.

Cg—60 to 70 inches; gray (5Y 6/1) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; massive; firm; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 40 to 60 inches. The thickness of the mollic epipedon ranges from 24 to 36 inches.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. The B2 horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 0 to 2. It ranges from slightly acid to mildly alkaline. The clay content in the 10- to 40-inch control section ranges from 35 to 42 percent. The B3 horizon has value of 5 or 6 and chroma of 0 or 1. It is neutral or mildly alkaline. The C horizon ranges from neutral to moderately alkaline.

Plano series

The Plano series consists of moderately well drained, moderately permeable soils on outwash plains and stream terraces. These soils formed in loess and in the underlying loamy outwash. Slopes range from 1 to 5 percent.

Plano soils commonly are adjacent to Drummer and Elburn soils. The poorly drained Drummer soils are in slight depressions and drainageways below the Plano soils. They do not have an argillic B horizon. The somewhat poorly drained Elburn soils are lower on the landscape than the Plano soils.

Typical pedon of Plano silt loam, 1 to 5 percent slopes, 450 feet west and 25 feet north of the southeast corner of sec. 19, T. 21 N., R. 7 E.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; neutral; abrupt

3/2) organic films on faces of peds; neutral; clear smooth boundary.

B1—16 to 20 inches; brown (10YR 4/3) silty clay loam; weak very fine subangular blocky structure; friable; many thin dark brown (10YR 3/3) organic films on faces of peds; slightly acid; clear smooth boundary.

B21t—20 to 24 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; many thin brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.

B22t—24 to 34 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; many thin brown (10YR 4/3) clay films on faces of peds; few fine irregular dark accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

B23t—34 to 47 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) mottles; moderate medium and coarse prismatic structure; friable; common thin brown (10YR 4/3) clay films on faces of peds; few fine irregular dark accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

IIB3t—47 to 62 inches; yellowish brown (10YR 5/4) stratified silt loam and loam; common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; patchy thin brown (10YR 4/3) and grayish brown (10YR 5/2) clay films lining pores and on faces of peds; few fine irregular dark accumulations (iron and manganese oxide); slightly acid; gradual smooth boundary.

underlying loamy outwash. Slopes range from 1 to 5 percent.

Proctor soils commonly are adjacent to Brenton, Drummer, and Elburn soils. The somewhat poorly drained Brenton and Elburn soils are lower on the landscape than the Proctor soils. Also, Elburn soils formed in more than 40 inches of loess. The poorly drained Drummer soils are in drainageways and slight depressions below the Proctor soils. They do not have an argillic B horizon.

Typical pedon of Proctor silt loam, 1 to 5 percent slopes, 66 feet south and 1,700 feet west of the northeast corner of sec. 34, T. 19 N., R. 9 E.

Ap—0 to 8 inches; very dark brown (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; moderate medium granular structure; friable; slightly acid; abrupt smooth boundary.

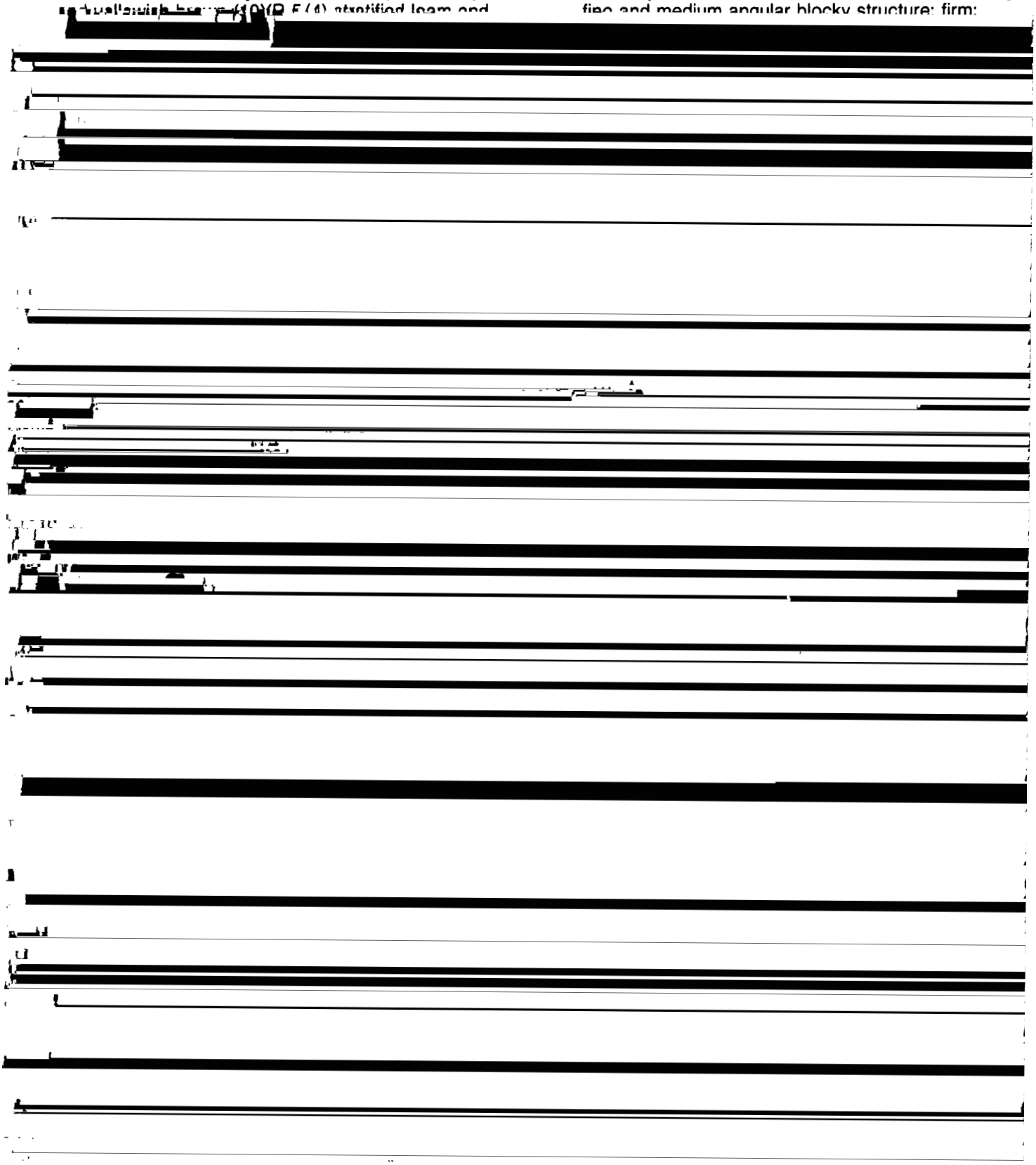
A3—8 to 14 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; slightly acid; clear smooth boundary.

B21t—14 to 19 inches; brown (10YR 4/3) silty clay loam; moderate medium and fine subangular blocky structure; firm; continuous moderately thick dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

B22t—19 to 27 inches; brown (10YR 4/3) silty clay loam; moderate medium and fine subangular blocky structure; firm; discontinuous dark brown (10YR 3/3) clay films on faces of peds; medium acid; clear smooth boundary.

B23t—27 to 36 inches; brown (10YR 4/3) silty clay loam; few fine faint grayish brown (10YR 5/2) and

IIC—50 to 66 inches; dark yellowish brown (10YR 4/4) [redacted] distinct yellowish brown (10YR 5/6) mottles; strong fine and medium angular blocky structure; firm;



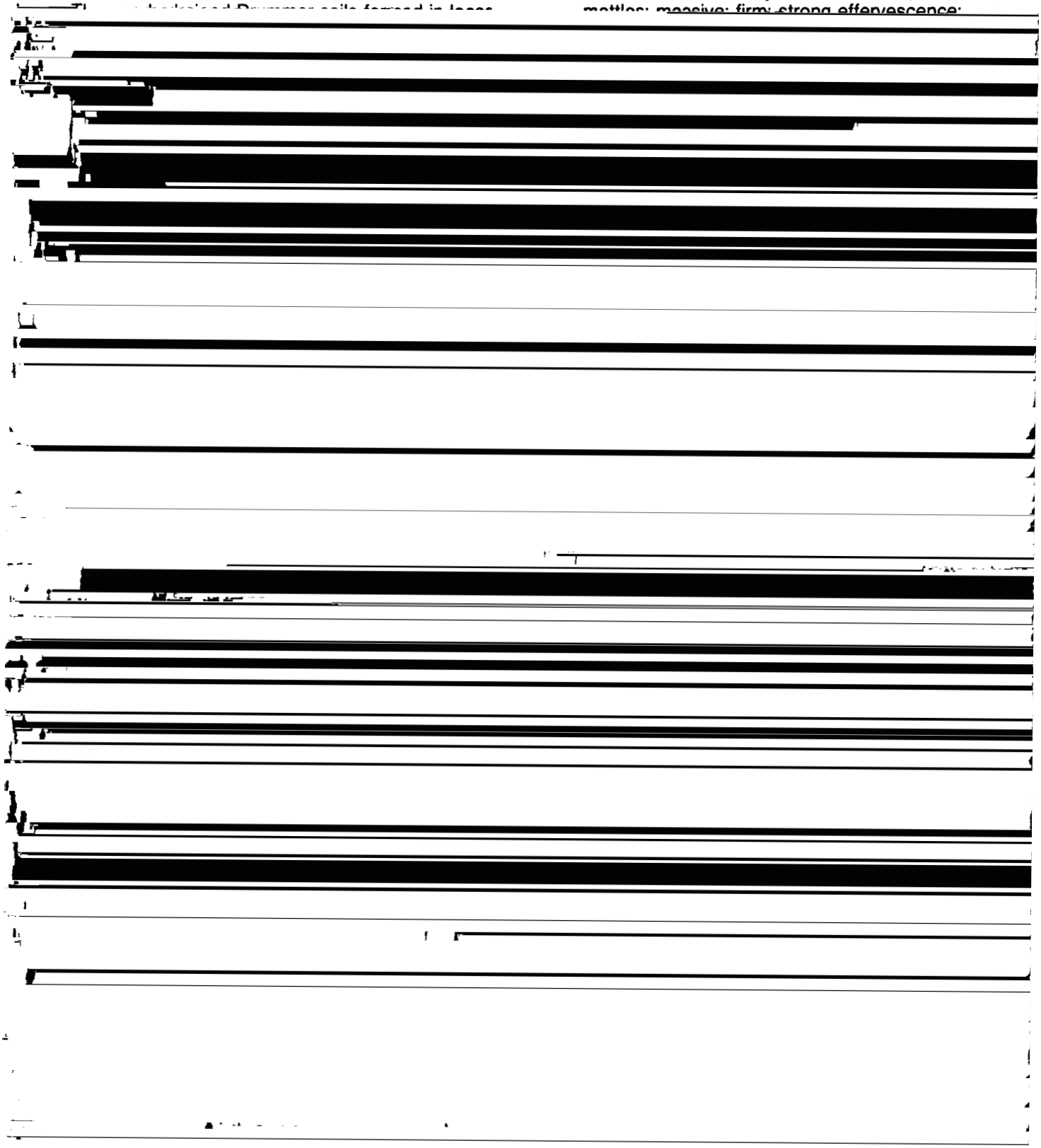
Typical pedon of Ross silt loam, 1,790 feet north and 225 feet west of the southeast corner of sec. 22, T. 21 N., R. 7 E.

Ap—0 to 10 inches; very dark gray (10YR 3/1) silt loam

A2—8 to 11 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak medium platy structure parting to moderate medium subangular blocky; friable; common thin dark grayish brown (10YR 4/2) coatings on faces of peds; medium acid; abrupt

section. Also, Xenia soils formed in a thinner mantle of

common fine distinct yellowish brown (10YR 5/6)



B23g—33 to 40 inches; gray (5Y 5/1) loam; many

B1—8 to 13 inches; brown (10YR 4/3) silty clay loam;

Sunbury series

The Sunbury series consists of somewhat poorly drained, moderately permeable soils on till plains. These soils formed in loess and in the underlying calcareous loam glacial till. Slopes range from 0 to 3 percent.

Sunbury soils commonly are adjacent to Birkbeck, Catlin, and Drummer soils. The moderately well drained Birkbeck and Catlin soils are higher on the landscape than the Sunbury soils. Also, Catlin soils have a mollic epipedon. The poorly drained Drummer soils formed in loess and stratified, loamy glacial outwash in drainageways and depressions below the Sunbury soils. They have a mollic epipedon and do not have an argillic B horizon.

Typical pedon of Sunbury silt loam, 0 to 3 percent

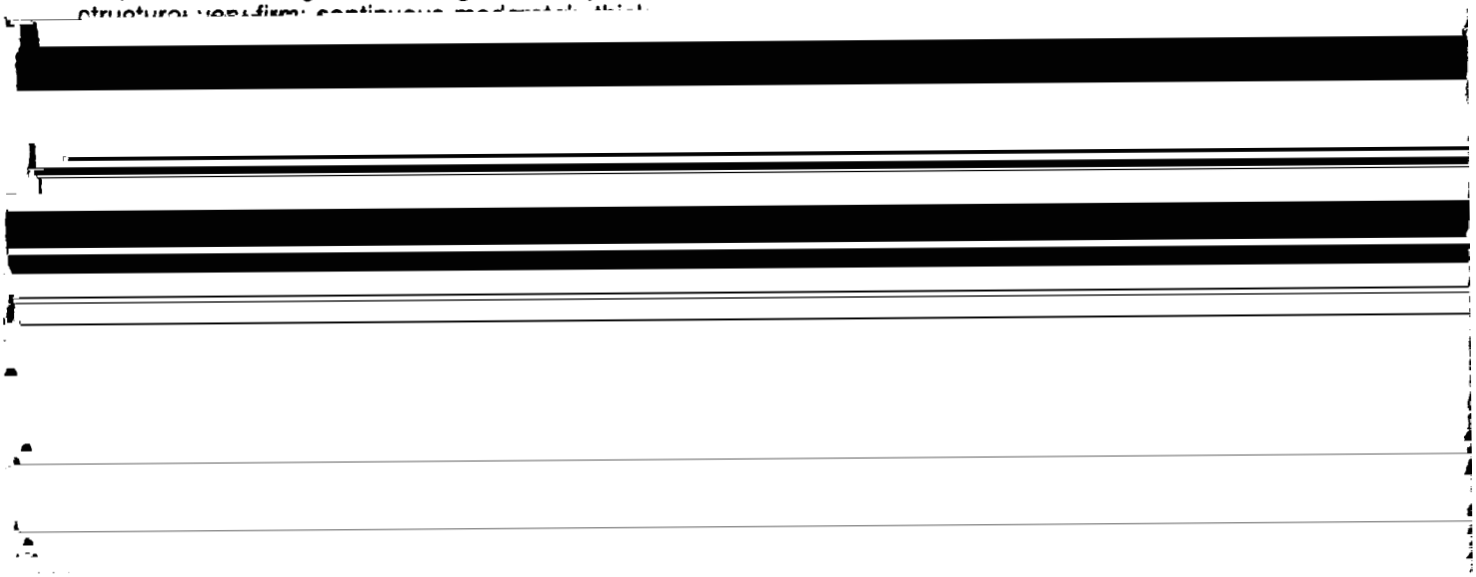
moderate medium subangular blocky structure; friable; common moderately thick black (10YR 2/1) clay films on faces of peds; slightly acid; clear smooth boundary.

IIB25t—43 to 52 inches; light olive brown (2.5Y 5/4) clay loam; common fine distinct yellowish brown (10YR 5/6) and common medium distinct light brownish gray (2.5Y 6/2) mottles; moderate medium prismatic structure; friable; common thick black (10YR 2/1) clay films lining pores and root channels; neutral; clear smooth boundary.

IIB3t—52 to 58 inches; light olive brown (2.5Y 5/4) clay loam; common medium distinct light brownish gray (2.5Y 6/2) mottles; weak coarse prismatic structure; firm; few moderately thick very dark gray (10YR 3/1) clay films lining pores and root channels; slight

A3—9 to 12 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate medium subangular blocky structure; firm; common moderately thick light olive brown (2.5Y 5/4) coatings on faces of peds; neutral; abrupt smooth boundary.

B21t—12 to 18 inches; light olive brown (2.5Y 5/4) silty clay; few fine faint olive gray (5Y 5/2) and olive (5Y 5/4) mottles; strong medium angular blocky structure; very firm; continuous moderately thick



dark grayish brown (2.5Y 4/2) clay films on faces of peds; many moderately thick very dark gray (10YR 3/1) clay films lining pores; neutral; clear smooth boundary.

B22t—18 to 27 inches; olive (5Y 5/3) silty clay; common medium distinct gray (5Y 6/1) and common medium faint olive (5Y 5/4) mottles; moderate medium prismatic structure; very firm; continuous moderately thick olive gray (5Y 5/2) clay films on faces of peds; many moderately thick very dark gray (10YR 3/1) clay films lining pores; neutral; clear wavy boundary.

IIB3t—27 to 38 inches; mottled gray (5Y 5/1) and light olive brown (2.5Y 5/4) silty clay; few fine distinct olive yellow (2.5Y 6/8) mottles; moderate coarse prismatic structure; very firm; many thin dark gray (10YR 4/1) clay films lining pores; few fine black accumulations (iron and manganese oxide); slight effervescence; few white (5Y 8/1) secondary lime concretions; mildly alkaline; gradual smooth boundary.

IIC—38 to 60 inches; mottled gray (5Y 6/1) and olive (5Y 5/3) silty clay; massive; very firm; few fine black accumulations (iron and manganese oxide); violent effervescence; common white (5Y 8/1) secondary lime concretions; moderately alkaline.

The thickness of the solum ranges from 24 to 50 inches. The depth to carbonates ranges from 20 to 35 inches. The thickness of the mollic epipedon ranges

above the Thorp soils. Flanagan soils contain more clay in the control section than the Thorp soils. Brenton, Elburn, and Plano soils do not have a grayish brown A2 horizon. Wea soils contain more sand in the control section than the Thorp soils. Also, they formed in coarser textured material.

Typical pedon of Thorp silt loam, 665 feet west and 685 feet south of the northeast corner of sec. 30, T. 19 N., R. 9 E.

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; neutral; abrupt smooth boundary.

A2—11 to 17 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; few fine faint dark yellowish brown (10YR 4/6) mottles; weak very thin platy structure parting to weak fine granular; friable; common thin very dark grayish brown (10YR 3/2) organic films on faces of peds; slightly acid; clear smooth boundary.

B1t—17 to 22 inches; grayish brown (10YR 5/2) silty clay loam; few fine faint dark yellowish brown (10YR 4/6) mottles; moderate fine subangular blocky structure; friable; many thin dark grayish brown (10YR 4/2) clay films and many thin light gray (10YR 7/1) silt coatings on faces of peds; slightly acid; clear smooth boundary.

B21t—22 to 33 inches; gray (10YR 5/1) silty clay loam; common fine distinct yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure; firm; common thin gray (10YR 5/1) and common moderately thick very dark gray (10YR 3/1) clay films on faces of peds; neutral; gradual smooth boundary.

B22t—33 to 53 inches; gray (10YR 5/1) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure; firm; few thin grayish brown (10YR 5/2) clay films on

mildly alkaline. It is stratified loam, silt loam, silty clay loam, clay loam, sandy clay loam, or sandy loam.

Varna series

The Varna series consists of moderately well drained, slowly permeable or moderately slowly permeable soils on till plains and moraines. These soils formed in a thin

The thickness of the solum ranges from 24 to 60 inches. The thickness of the mollic epipedon ranges from 10 to 16 inches.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is silt loam or silty clay loam. The Bt horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 3 or 4. It ranges from medium acid to neutral in the upper part and from slightly acid to moderately alkaline

films on faces of peds; slightly acid; clear smooth boundary.

[redacted]

brown (10YR 6/3) dry; moderate medium platy structure; friable; many thin light brownish gray

formation of the soils

By Mark R. La Van, Champaign County soil scientist, with help from

Soils on flood plains and other areas on bottom land

Soil forming processes act on parent material deposited by geologic agents, such as wind, water, or glacial ice. The characteristics of the soil are determined

silty clay loam. In many areas the flood plains still receive sediments. Ross soils formed in loamy sediments on alluvial flood plains and low terraces along the major streams. The nearly level Colo soils formed in

carbonates are leached, the downward movement of clay, and the rate of other chemical and physical processes.

plant and animal life

Living organisms, such as plants, animals, bacteria, and fungi, affect soil formation. Burrowing animals help to keep the soil open and porous (fig. 18). Bacteria and fungi help to decompose plant and animal remains. The plant cover generally determines the content of organic matter, the color of the surface layer, and the amount of plant nutrients.

On about 93 percent of the acreage, the soils in Champaign County formed under prairie grasses. Drummer and Elburn soils are examples. They have a dark surface layer and a high content of organic matter. The perennial fires on the prairie tended to restrict the forest vegetation to areas near the major drainageways. On only about 7 percent of the acreage, the soils formed under forest vegetation. Russell and St. Charles soils are examples. Their surface layer is lighter colored than that of Drummer or Elburn soils. Also, the content of organic matter is lower.

climate

Climate affects the types of plants on the soil and the weathering of soil material. The midcontinental climate in Champaign County has favored the generally rapid weathering of soil material, the formation of clay, and the downward movement of clay through the profile. As a result of the translocation of clay, the subsoil of most upland soils in the county contains more clay than the surface layer. Further information about the climate is provided under the heading "General nature of the county."

topography

Topography characteristics, such as the gradient, shape, and aspect of slopes, cause many differences among soils. They affect drainage, erosion, and deposition. Soils that formed in similar parent material, such as Drummer, Kendall, and St. Charles soils, may differ because of topography. On the other hand, soils that formed in areas where the topography is similar may have similar drainage characteristics, even though the parent materials differ. Brenton and Raub soils are examples.

time

Time greatly affects the degree of profile development in a soil. The influence of time, however, can be modified by erosion, the deposition of material, the topography, and the kind of parent material.

On the more sloping soils, erosion may remove the surface soil material as soon as the soil forms. These soils are immature, or young, even though the slopes have been exposed to weathering for thousands of years. Chatsworth soils are an example.

The soils on flood plains receive alluvial material during each flood. This repeated deposition slows soil formation. Colo soils are an example.

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glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with

surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Excessively drained.—Water is removed from the soil very rapidly. The soils in this class generally are free of mottles throughout. They commonly are shallow, very porous, or steep, or a combination of these.

Somewhat excessively drained.—Water is removed from the soil rapidly. The soils in this class generally are free of mottles throughout. They commonly are shallow or moderately deep, very porous, or steep, or a combination of these.

Well drained.—Water is removed from the soil so readily that the upper 40 inches generally does not have the mottles or dull colors related to wetness.

Moderately well drained.—Water is removed from the soil so slowly that the upper 20 to 40 inches has the mottles or dull colors related to wetness. The

building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid

rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can

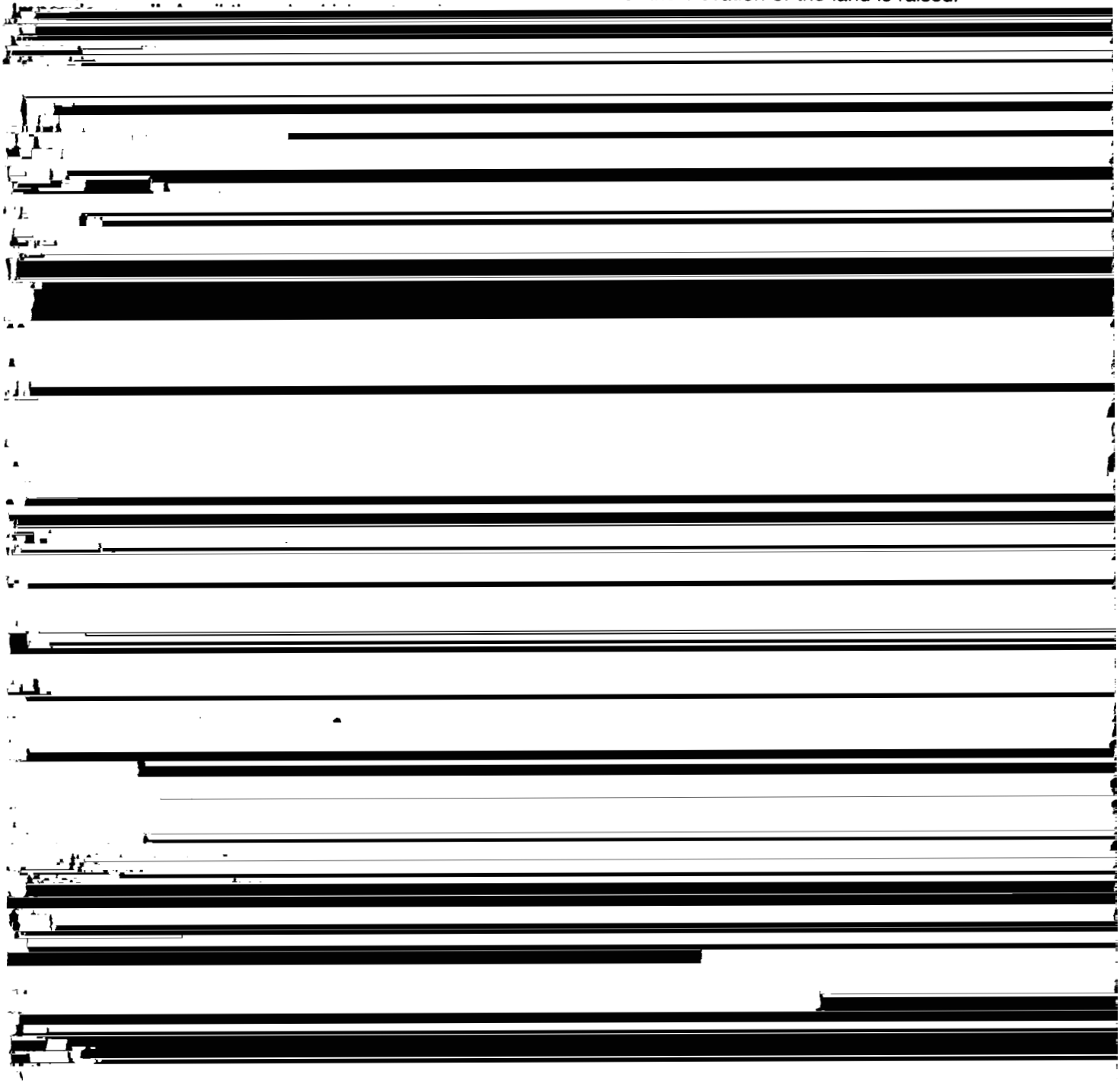
have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.



millimeters (about 0.2 inch); *medium*, from 5 to 15

Phase, soil. A subdivision of a soil series based on

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A horizon. Includes all subdivisions of this horizon (A1, A2, and A3).

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

[redacted]

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Weathering. All physical and chemical changes

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Data were recorded in the period 1951-73 at Urbana, Illinois]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	33.2	18.0	25.6	60	-11	18	1.56	.63	2.35	4	5.3
February	37.4	21.0	29.3	62	-8	18	1.87	.89	2.70	5	5.7
March	47.9	30.5	39.2	78	9	172	3.24	1.43	4.78	7	5.2
April	62.2	41.7	52.0	84	25	364	3.79	2.00	5.34	8	.8
May	73.0	51.6	62.3	91	35	691	3.57	2.07	4.90	7	.0
June	82.7	61.0	71.8	97	46	954	4.40	2.42	6.14	7	.0
July	85.0	64.8	74.9	96	51	1,082	4.81	2.72	6.65	6	.0
August	83.8	62.7	73.2	94	47	1,029	3.06	1.44	4.44	4	.0
September	78.7	55.7	67.2	95	38	816	2.99	.87	4.70	5	.0
October	66.4	44.6	55.6	87	26	484	2.79	.93	4.31	5	.0
November	50.1	33.3	41.7	74	10	125	2.45	1.27	3.48	5	1.9
December	38.4	24.3	31.4	65	-3	33	2.40	.73	3.76	5	3.8
Yearly:											
Average	61.6	42.4	52.0	---	---	---	---	---	---	---	---
Extreme	---	---	---	100	-12	---	---	---	---	---	---
Total	---	---	---	---	---	5,786	36.93	30.76	44.37	68	22.7

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data were recorded in the period 1951-73 at Urbana, Illinois]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 8	April 17	April 29
2 years in 10 later than--	April 3	April 13	April 25
5 years in 10 later than--	March 24	April 5	April 16
First freezing temperature in fall:			
1 year in 10 earlier than--	October 26	October 20	October 15
2 years in 10 earlier than--	November 1	October 24	October 19
5 years in 10 earlier than--	November 10	November 1	October 26

TABLE 3.--GROWING SEASON

[Data were recorded in the period 1951-73 at Urbana, Illinois]

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	210	192	178
8 years in 10	217	198	183
5 years in 10	231	209	192
2 years in 10	245	221	200
1 year in 10	252	227	205

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
23A	Blount silt loam, 0 to 2 percent slopes	1,005	0.2
23B	Blount silt loam, 2 to 5 percent slopes	624	0.1
27B	Miami silt loam, 2 to 5 percent slopes	267	*
27C2	Miami silt loam, 5 to 10 percent slopes, eroded	755	0.1
27D2	Miami silt loam, 10 to 15 percent slopes, eroded	429	0.1
27E2	Miami silt loam, 15 to 25 percent slopes, eroded	406	0.1
56B	Dana silt loam, 2 to 5 percent slopes	23,839	3.7
67	Harpster silty clay loam	2,252	0.4
73	Ross silt loam	1,001	0.2
91B	Swygert silty clay loam, 1 to 5 percent slopes	3,448	0.5
102A	La Hogue loam, 0 to 3 percent slopes	1,476	0.2
125	Selma loam	2,703	0.4
131B	Alvin sandy loam, 1 to 5 percent slopes	212	*
134B	Camden silt loam, 1 to 5 percent slopes	1,244	0.2
146B	Elliott silt loam, 1 to 5 percent slopes	31,039	4.8
148B	Proctor silt loam, 1 to 5 percent slopes	8,881	1.4
149A	Brenton silt loam, 0 to 3 percent slopes	16,183	2.5
150B	Onarga sandy loam, 1 to 5 percent slopes	268	*
152	Drummer silty clay loam	248,094	38.8
153	Pella silty clay loam	6,368	1.0
154A	Flanagan silt loam, 0 to 3 percent slopes	99,607	15.6
171B	Catlin silt loam, 2 to 7 percent slopes	16,069	2.5
194B	Morley silt loam, 2 to 5 percent slopes	738	0.1
194C2	Morley silt loam, 5 to 12 percent slopes, eroded	890	0.1
194D2	Morley silt loam, 12 to 20 percent slopes, eroded	251	*
198A	Elburn silt loam, 0 to 3 percent slopes	17,048	2.7
199B	Plano silt loam, 1 to 5 percent slopes	5,330	0.8
206	Thorp silt loam	2,736	0.4
219	Millbrook silt loam	1,426	0.2
221B	Parr silt loam, 2 to 5 percent slopes	7,708	1.2
221C2	Parr silt loam, 5 to 10 percent slopes, eroded	5,821	0.9
221D3	Parr clay loam, 10 to 15 percent slopes, severely eroded	330	0.1
223B2	Varna silt loam, 2 to 5 percent slopes, eroded	11,142	1.7
223C3	Varna silty clay loam, 5 to 12 percent slopes, severely eroded	3,044	0.5
232	Ashkum silty clay loam	28,281	4.4
233B	Birkbeck silt loam, 1 to 5 percent slopes	2,735	0.4
234A	Sunbury silt loam, 0 to 3 percent slopes	1,797	0.3
235	Bryce silty clay	1,489	0.2
236A	Sabina silt loam, 0 to 3 percent slopes	2,760	0.4
241D	Chatsworth silty clay, 7 to 15 percent slopes	288	*
242A	Kendall silt loam, 0 to 3 percent slopes	1,545	0.2
243B	St. Charles silt loam, 1 to 5 percent slopes	1,842	0.3
291B	Xenia silt loam, 2 to 5 percent slopes	5,299	0.8
302	Ambraw silty clay loam	2,687	0.4
322C2	Russell silt loam, 4 to 11 percent slopes, eroded	1,867	0.3
330	Peotone silty clay loam	3,678	0.6
387B	Ockley silt loam, 1 to 5 percent slopes	1,174	0.2
387C3	Ockley clay loam, 5 to 12 percent slopes, severely eroded	278	*
398A	Wea silt loam, 0 to 3 percent slopes	3,213	0.5
402	Colo silty clay loam	10,643	1.7
440B	Jasper loam, 1 to 5 percent slopes	2,410	0.4
440C2	Jasper loam, 5 to 10 percent slopes, eroded	778	0.1
448B	Mona silt loam, 2 to 7 percent slopes	297	*
481A	Raub silt loam, 0 to 3 percent slopes	22,269	3.5
490A	Odell silt loam, 0 to 3 percent slopes	1,319	0.2
533	Urban land	1,235	0.2
570B	Martinsville silt loam, 2 to 5 percent slopes	778	0.1
570C2	Martinsville loam, 5 to 10 percent slopes, eroded	1,054	0.2
570D2	Martinsville loam, 10 to 18 percent slopes, eroded	275	*
637	Muskego silty clay loam, overwash	44	*
802	Orthents, loamy	3,554	0.6
865	Pits, gravel	313	*
2027C	Miami-Urban land complex, 2 to 10 percent slopes	384	0.1
2152	Drummer-Urban land complex, 0 to 2 percent slopes	4,300	0.7
2154A	Flanagan-Urban land complex, 0 to 3 percent slopes	3,695	0.6
2171B	Catlin-Urban land complex, 2 to 7 percent slopes	1,662	0.3
2198A	Elburn-Urban land complex, 0 to 3 percent slopes	766	0.1
2236A	Sabina-Urban land complex, 0 to 3 percent slopes	232	*
2481A	Raub-Urban land complex, 0 to 3 percent slopes	1,163	0.2
	Water	1,262	0.2
	Total	640,000	100.0

* Less than 0.1 percent.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Only arable soils are listed. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
	Bu	Bu	Bu	Bu	Ton	AUM*
23A---- Blount	106	35	48	64	4.3	---
23B---- Blount	105	35	47	63	4.3	---
27B---- Miami	110	38	50	---	3.6	---
27C2---- Miami	95	33	43	---	3.1	---
27D2---- Miami	80	28	36	---	2.6	---
56B----	130	46	52	---	4.3	---
67---- Harpster	136	44	52	74	5.0	8.3
73---- Ross	130	44	50	---	5.0	---
91B---- Swygert	113	39	50	72	4.5	---
102A---- La Hogue	129	43	56	80	5.2	8.6
125---- Selma	136	44	53	76	5.0	---
131B---- Alvin	97	33	48	---	4.3	7.1
134B---- Camden	124	39	54	71	5.0	8.2
146B---- Elliott	127	45	54	78	5.1	8.4
148B---- Proctor	143	44	58	87	5.4	9.1
149A---- Brenton	126	47	62	91	5.9	9.8
150B---- Onarga	109	36	48	73	4.2	6.9
152---- Drummer	154	51	61	83	5.5	9.2
153---- Pella	125	45	50	75	4.8	8.0
154A---- Flanagan	162	52	67	92	6.1	10.2

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
	Bu	Bu	Bu	Bu	Ton	AUM*
171B---------- Catlin	149	46	60	86	5.7	9.6
194B---------- Morley	102	35	47	63	4.3	7.0
194C2---------- Morley	100	34	46	62	4.2	6.9
194D2---------- Morley	90	---	41	56	3.7	6.2
198A---------- Elburn	161	50	63	94	6.1	10.2
199B---------- Plano	150	45	59	89	5.7	9.6
206---------- Thorp	105	36	42	60	4.0	7.0
219---------- Millbrook	144	43	59	81	5.4	9.0
221B---------- Parr	120	42	54	---	4.0	---
221C2---------- Parr	105	37	47	---	3.4	---
221D3---------- Parr	---	---	39	---	2.8	---
223B2---------- Varna	122	41	52	74	4.8	7.9
223C3---------- Varna	107	36	46	65	4.2	7.0
232---------- Ashkum	130	47	54	79	5.0	---
233B---------- Birkbeck	122	41	54	69	4.9	8.2
234A---------- Sunbury	149	45	62	84	5.6	8.1
235---------- Bryce	120	43	48	70	4.4	---
236A---------- Sabina	133	42	56	75	5.2	8.7
241D---------- Chatsworth	---	---	---	---	---	1.0
242A---------- Kendall	135	41	55	75	5.2	8.7
243B---------- St. Charles	126	39	55	72	5.0	8.1
291B---------- Xenia	120	42	48	---	4.0	---
302----------	110	36	42	61	4.1	

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
	Bu	Bu	Bu	Bu	Ton	AUM*
322C2--Russell	105	37	42	---	3.4	---
330--Peotone	123	42	43	58	4.2	---
387B--Ockley	110	38	44	---	3.6	---
387C3--Ockley	90	32	36	---	3.0	---
398A--Wea	120	42	48	---	4.0	---
402--Colo	104	40	---	78	4.2	7.0
440B--Jasper	125	44	50	---	4.1	---
440C2--Jasper	120	42	48	---	4.0	---
448B--Mona	114	37	50	33	4.5	7.4
481A--Raub	140	49	56	---	4.6	---
490A--Odell	130	46	58	---	4.3	---
570B--Martinsville	120	42	48	---	4.0	---
570C2--Martinsville	105	37	42	---	3.4	---
570D2--Martinsville	90	32	36	---	3.0	---
637--Muskego	123	42	---	---	4.0	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
23A, 23B---------- Blount	3c	Slight	Slight	Severe	Severe	White oak----------	65	Eastern white pine, red pine, yellow-poplar.
						Northern red oak----	65	
						Green ash----------	---	
						Bur oak----------	---	
						Pin oak----------	---	
27B, 27C2, 27D2---- Miami	1o	Slight	Slight	Slight	Slight	White oak----------	90	Eastern white pine, red pine, white ash, yellow-poplar, black walnut.
						Yellow-poplar-------	98	
27E2---------- Miami	1r	Moderate	Moderate	Slight	Slight	White oak----------	90	Eastern white pine, red pine, white ash, yellow-poplar, black walnut.
						Yellow-poplar-------	98	
56B---------- Dana	---	---	---	---	---	---	---	Eastern white pine, red pine, white ash, yellow-poplar, black walnut.
67---------- Harpster	---	---	---	---	---	---	---	American sycamore, red maple, green ash, pin oak, common hackberry, European larch, swamp white oak.
73---------- Ross	1o	Slight	Slight	Slight	Slight	Northern red oak----	86	Eastern white pine, black walnut, white ash, yellow-poplar.
						Yellow-poplar-------	96	
						Sugar maple---------	85	
91B---------- Swygert	---	---	---	---	---	---	---	Green ash, European larch, pin oak.
102A---------- La Hogue	---	---	---	---	---	---	---	American sycamore, eastern cottonwood, green ash, bur oak, eastern white pine.
125---------- Selma	---	---	---	---	---	---	---	American sycamore, common hackberry, European larch, green ash, pin oak, red maple, swamp white oak.
131B---------- Alvin	2o	Slight	Slight	Slight	Slight	White oak----------	80	Green ash, black walnut, yellow-poplar, white oak, eastern white pine, American sycamore, sugar maple.
						Northern red oak----	80	
						Black walnut--------	---	
						Yellow-poplar-------	90	
134B---------- Camden	1o	Slight	Slight	Slight	Slight	Yellow-poplar-------	95	White oak, black walnut, green ash, eastern white pine, red pine, yellow-poplar, white ash.
						White oak----------	85	
						Northern red oak----	85	
						Green ash----------	76	

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
206---------- Thorp	---	---	---	---	---	---	---	Eastern cottonwood, American sycamore, red maple, green ash, pin oak.
219---------- Millbrook	2o	Slight	Slight	Slight	Slight	White oak----------	80	White oak, black walnut, northern red oak, green ash, sugar maple.
						Northern red oak----	80	
						Yellow-poplar-------	90	
						Black walnut--------	---	
221B, 221C2, 221D3- Parr	---	---	---	---	---	---	---	Eastern white pine, red pine, white ash, yellow-poplar, black walnut.
223B2, 223C3------- Varna	---	---	---	---	---	---	---	White oak, black walnut, northern red oak, green ash, sugar maple, eastern white pine.
232---------- Ashkum	---	---	---	---	---	---	---	American sycamore, common hackberry, European larch, green ash, pin oak, red maple, swamp white oak.
233B---------- Birkbeck	1o	Slight	Slight	Slight	Slight	White oak----------	86	White oak, northern red oak, green ash, black walnut, eastern white pine, red pine.
						Northern red oak----	---	
						Green ash----------	---	
234A---------- Sunbury	---	---	---	---	---	---	---	American sycamore, eastern cottonwood, green ash, red maple, eastern white pine.
236A---------- Sabina	2o	Slight	Slight	Slight	Slight	White oak----------	80	White oak, northern red oak, eastern cottonwood, American sycamore, sugar maple, eastern white pine.
						Northern red oak----	80	
						Black walnut--------	---	
242A---------- Kendall	2o	Slight	Slight	Slight	Slight	White oak----------	80	White oak, northern red oak, green ash, eastern white pine, red pine.
						Northern red oak----	80	
						Yellow-poplar-------	90	
						Black walnut--------	---	
243B---------- St. Charles	1o	Slight	Slight	Slight	Slight	Yellow-poplar-------	95	White oak, black walnut, sugar maple, eastern white pine, red pine.
						White oak----------	85	
						Northern red oak----	85	
						Green ash----------	---	
291B---------- Xenia	1o	Slight	Slight	Slight	Slight	White oak----------	90	Eastern white pine, red pine, black walnut, yellow-poplar, white ash.
						Yellow-poplar-------	98	

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
302---------- Ambraw	---	---	---	---	---	---	---	Eastern cottonwood, red maple, American sycamore, pin oak.
322C2---------- Russell	1o	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Yellow-poplar-------	90 90 98	Eastern white pine, red pine, white ash, yellow-poplar, black walnut.
330---------- Peotone	---	---	---	---	---	---	---	Pin oak, green ash, red maple, American sycamore, common hackberry, eastern cottonwood, European larch, swamp white oak.
387B, 387C3-------- Ockley	1o	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Yellow-poplar-------	90 90 98	Eastern white pine, red pine, white ash, yellow-poplar, black walnut.
398A---------- Wea	---	---	---	---	---	---	---	Eastern white pine, red pine, black walnut, yellow-poplar white ash.
440B, 440C2-------- Jasper	---	---	---	---	---	---	---	Eastern white pine, white ash, yellow-poplar, black walnut.
448B---------- Mona	---	---	---	---	---	---	---	Black walnut, American sycamore, green ash, bur oak, common hackberry, eastern

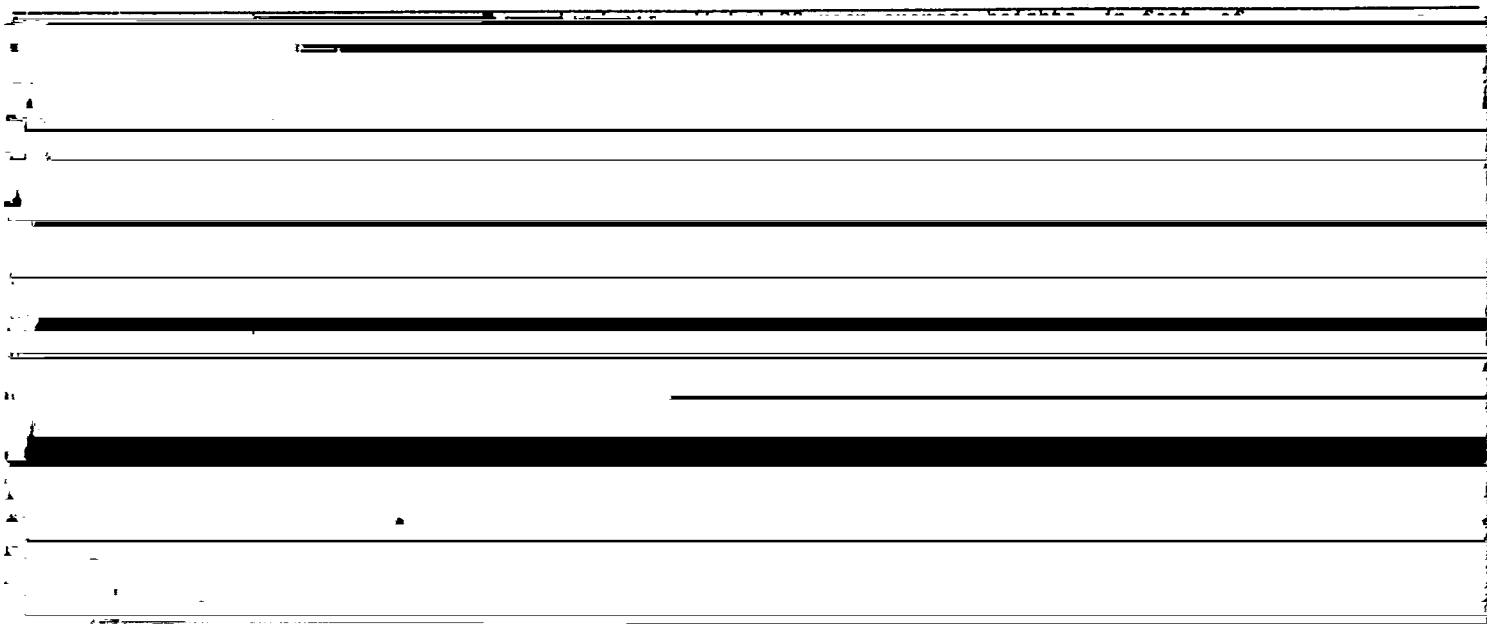
TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
2152*:								
Drummer	---	---	---	---	---	---	---	Eastern cottonwood, American sycamore, red maple, green ash, pin oak.
Urban land.								
2154A*:								
Flanagan	---	---	---	---	---	---	---	Eastern cottonwood, green ash, yellow-poplar, eastern white pine.
Urban land.								
2171B*:								
Catlin	---	---	---	---	---	---	---	Black walnut, white oak, green ash, northern red oak, eastern white pine, white ash.
Urban land.								
2198A*:								
Elburn	---	---	---	---	---	---	---	Eastern cottonwood, green ash, yellow-poplar, eastern white pine.
Urban land.								
2236A*:								
Sabina	2o	Slight	Slight	Slight	Slight	White oak	80	White oak, northern red oak, eastern cottonwood, American sycamore, sugar maple, eastern white pine.
						Northern red oak	80	
						Black walnut	---	
Urban land.								
2481A*:								
Raub	---	---	---	---	---	---	---	Eastern white pine, white ash, red maple, yellow-poplar, American sycamore.
Urban land.								

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

[The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil]



Soil name and map symbol	<8	8-15	16-25	26-35	>35
23A, 23B---------- Blount	---	American cranberrybush, Tatarian honeysuckle, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osageorange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
27B, 27C2, 27D2--- Miami	---	Amur honeysuckle, Amur privet, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
27E2. Miami					
56B---------- Dana	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
67---------- Harpster	---	Tatarian honeysuckle, nannyberry viburnum, Washington hawthorn.	White spruce, northern white-cedar, eastern redcedar, green ash, osageorange.	Black willow------	---
73---------- Ross	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir, Austrian	Norway spruce-----	Pin oak, eastern white pine.

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
131B---------- Alvin	---	Amur privet, Washington hawthorn, Amur honeysuckle, American cranberrybush, Tatarian honeysuckle.	Austrian pine, northern white-cedar, osageorange, eastern redcedar.	Eastern white pine, red pine, Norway spruce.	---
134B---------- Camden	---	Amur honeysuckle, Amur privet, silky dogwood, American cranberrybush.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
146B---------- Elliott	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

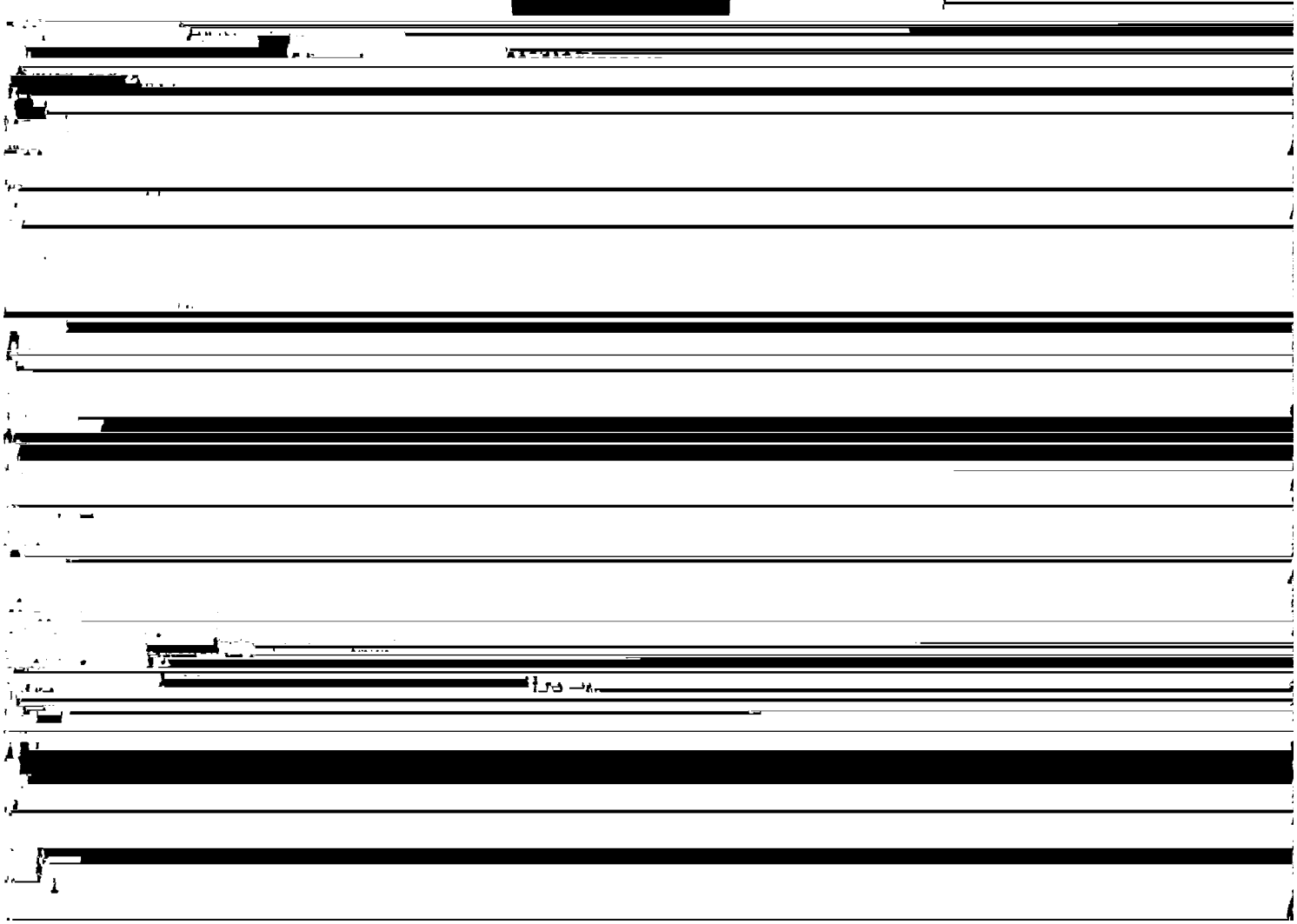


TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
194B, 194C2, 194D2---------- Morley	---	American cranberrybush, Tatarian honeysuckle, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osageorange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
198A---------- Elburn	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, northern white-cedar, Washington hawthorn, blue spruce.	Norway spruce-----	Eastern white pine, pin oak.
199B---------- Plano	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
206----------	---	Silky dogwood,	Washington	Eastern white pine	Pin oak.

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
234A---------- Sunbury	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir, Austrian pine.	Norway spruce-----	Pin oak, eastern white pine.
235---------- Bryce	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
236A---------- Sabina	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Pin oak, eastern white pine.
241D---------- Chatsworth	Tatarian honeysuckle, lilac, Amur honeysuckle.	Eastern redcedar	Austrian pine-----	---	---
242A---------- Kendall	---	Amur privet, Washington hawthorn, silky dogwood, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar.	Norway spruce-----	Eastern white pine, pin oak.
243B---------- St. Charles	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
291B---------- Xenia	---	Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn, Amur privet.	Norway spruce-----	Eastern white pine, pin oak.
302---------- Ambraw	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
322C2---------- Russell	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
330---------- Peotone	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
387B, 387C3---- Ockley	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
398A---------- Wea	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, northern white-cedar, blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Pin oak, eastern white pine.
402---------- Colo	Gray dogwood, silky dogwood.	Tatarian honeysuckle, redosier dogwood, Zabel honeysuckle.	Laurel willow, white spruce, Amur maple, northern white-cedar.	Green ash---------	Silver maple, eastern cottonwood.
440B, 440C2---- Jasper	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, northern white-cedar, blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
448B---------- Mona	---	Amur privet, Amur honeysuckle, American	White fir, blue spruce, Washington	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
			cedar.		
481A---------- Raub	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
490A----------	---	Amur honeysuckle.	White fir.	Norway spruce-----	Eastern white

TABLE 7.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
2027C*:					
Miami	---	Amur honeysuckle, Amur privet, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Urban land.					
2152*:					
Drummer	---	American cranberrybush, Amur honeysuckle, silky dogwood, Amur privet.	Norway spruce, Washington hawthorn, white fir, blue spruce, Austrian pine.	Eastern white pine	Pin oak.
Urban land.					
2154A*:					
Flanagan	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Austrian pine, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak
Urban land.					
2171B*:					
Catlin	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
Urban land.					
2198A*:					
Elburn	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, northern white-cedar, Washington hawthorn, blue spruce.	Norway spruce	Eastern white pine, pin oak.
Urban land.					
2236A*:					
Sabina	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Pin oak, eastern white pine.
Urban land.					
2481A*:					
Raub	---	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Urban land.					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
23A, 23B---------- Blount	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
27B---------- Miami	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
27C2---------- Miami	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight----------	Slight.
27D2---------- Miami	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
27E2---------- Miami	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
56B---------- Dana	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
67---------- Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
73---------- Ross	Severe: flooding.	Slight----------	Moderate: flooding.	Slight----------	Moderate: flooding.
91B---------- Swygert	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
102A---------- La Hogue	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
125---------- Selma	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
131B---------- Alvin	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
134B---------- Camden	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
146B---------- Elliott	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
148B---------- Proctor	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
149A---------- Brenton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
150B---------- Onarga	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
152---------- Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
153---------- Pella	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
154A---------- Flanagan	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
171B---------- Catlin	Severe: excess humus.	Severe: excess humus.	Severe: excess humus.	Severe: excess humus.	Slight.
194B---------- Morley	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
194C2---------- Morley	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
194D2---------- Morley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
198A---------- Elburn	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
199B---------- Plano	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
206---------- Thorp	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
219---------- Millbrook	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
221B---------- Parr	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
221C2---------- Parr	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
221D3---------- Parr	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
223B2---------- Varna	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----------	Slight.
223C3---------- Varna	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: large stones, slope.
232---------- Ashkum	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
233B---------- Birkbeck	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
234A---------- Sunbury	Severe: wetness, excess humus.	Severe: excess humus.	Severe: excess humus, wetness.	Severe: excess humus.	Moderate: wetness.
235---------- Bryce	Severe: ponding, percs slowly, too clayey.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, percs slowly.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
236A---------- Sabina	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
241D---------- Chatsworth	Severe: percs slowly, too clayey.	Severe: too clayey, percs slowly.	Severe: slope, too clayey, percs slowly.	Severe: too clayey.	Severe: droughty, too clayey.
242A---------- Kendall	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
243B---------- St. Charles	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
291B---------- Xenia	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Slignt.
302---------- Ambraw	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
322C2---------- Russell	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
330---------- Peotone	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
387B---------- Ockley	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
387C3---------- Ockley	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
398A---------- Wea	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
402---------- Colo	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
440B---------- Jasper	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
440C2---------- Jasper	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
448B---------- Mona	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Slight----------	Slight.
481A---------- Raub	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
490A---------- Odell	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
533*. Urban land					
570B---------- Martinsville	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
570C2---------- Martinsville	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
570D2---------- Martinsville	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
637---------- Muskego	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
802*. Orthents					

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
865*. Pits					
2027C*: Miami	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
Urban land.					
2152*: Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Urban land.					
2154A*: Flanagan	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
2171B*: Catlin	Severe: excess humus.	Severe: excess humus.	Severe: excess humus.	Severe: excess humus.	Slight.
Urban land.					
2198A*: Elburn	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
2236A*: Sabina	Severe:	Moderate:	Severe:	Moderate:	Moderate:

TABLE 9.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
23A---------- Blount	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
23B---------- Blount	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
27B---------- Miami	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
27C2---------- Miami	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
27D2, 27E2--------- Miami	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
56B---------- Dana	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
67---------- Harpster	Fair	Fair	Good	Fair	Good	Fair	Fair	Fair	Fair.
73---------- Ross	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
91B---------- Swygert	Fair	Good	Good	Good	Fair	Poor	Good	Good	Poor.
102A---------- La Hogue	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
125---------- Selma	Good	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
131B---------- Alvin	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
134B---------- Camden	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
146B---------- Elliott	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor.
148B---------- Proctor	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
149A---------- Brenton	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.

TABLE 9.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
194B---------- Morley	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
194C2---------- Morley	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
194D2---------- Morley	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
198A---------- Elburn	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
199B---------- Plano	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
206---------- Thorp	Good	Good	Good	Good	Good	Good	Good	Good	Good.
219---------- Millbrook	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
221B---------- Parr	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
221C2---------- Parr	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
221D3---------- Parr	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
223B2---------- Varna	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
223C3---------- Varna	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
232---------- Ashkum	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
233B---------- Birkbeck	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
234A---------- Sunbury	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
235---------- Bryce	Good	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
236A---------- Sabina	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
241D---------- Chatsworth	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Poor	Very poor	Very poor.
242A---------- Kendall	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
243B---------- St. Charles	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
291B---------- Xenia	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
302---------- Ambraw	Good	Fair	Good	Good	Good	Good	Good	Good	Good.
322C2---------- Russell	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.

TABLE 9.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
330---------- Peotone	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
387B---------- Ockley	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
387C3---------- Ockley	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
398A---------- Wea	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
402---------- Colo	Good	Fair	Good	Fair	Good	Good	Fair	Fair	Good.
440B---------- Jasper	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
440C2---------- Jasper	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
448B---------- Mona	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
481A---------- Raub	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
490A---------- Odell	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
533*. Urban land									
570B---------- Martinsville	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
570C2---------- Martinsville	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
570D2---------- Martinsville	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
637---------- Muskego	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
802*. Orthents									
865*. Pits									
2027C*: Miami----------	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Urban land.									
2152*: Drummer----------	Fair	Good	Good	Fair	Good	Good	Good	Fair	Good.
Urban land.									
2154A*: Flanagan----------	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.									

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
2171B*:									
Catlin	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Urban land.									
2198A*:									
Elburn	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.									
2236A*:									
Sabina	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.									
2481A*:									
Raub	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.									

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
23A, 23B---------- Blount	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
27B---------- Miami	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: frost action, low strength.	Slight.
27C2---------- Miami	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Moderate: frost action, low strength.	Slight.
27D2---------- Miami	Moderate: slope.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: slope, frost action, low strength.	Moderate: slope.
27E2---------- Miami	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
56B---------- Dana	Moderate: rooting depth, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
67---------- Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
73---------- Ross	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
91B---------- Swygert	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
102A---------- La Hogue	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
125---------- Selma	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
131B----------	Severe:	Slight---------	Slight---------	Slight---------	Moderate:	Slight.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
152--Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
153--Pella	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
154A--Flanagan	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
171B--Catlin	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
194B--Morley	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
194C2--Morley	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
194D2--Morley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
198A--Elburn	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
199B--Plano	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
206--Thorp	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding.
219--Millbrook	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
221B--Parr	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Severe: low strength.	Slight.
221C2--Parr	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
221D3--Parr	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
223B2--Varna	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
223C3--Varna	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: large stones, slope.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
232--- Ashkum	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
233B--- Birkbeck	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
234A--- Sunbury	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
235--- Bryce	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding, too clayey.
236A--- Sabina	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
241D--- Chatsworth	Moderate: too clayey, dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Severe: droughty, too clayey.
242A--- Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
243B--- St. Charles	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
291B--- Xenia	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
302--- Ambraw	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
322C2--- Russell	Slight---	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
330--- Peotone	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.
387B--- Ockley	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
387C3--- Ockley	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
398A--- Wea	Slight---	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
402--- Colo	Severe: wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, low strength, frost action.	Severe: wetness.
440B--- Jasper	Slight---	Slight---	Slight---	Slight---	Moderate: low strength, frost action.	Slight.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
440C2---------- Jasper	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength, frost action.	Slight.
448B---------- Mona	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
481A---------- Raub	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
490A---------- Odell	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
533* Urban land						
570B---------- Martinsville	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, frost action.	Slight.
570C2---------- Martinsville	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Slight.
570D2---------- Martinsville	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
637---------- Muskego	Severe: excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, frost action.	Severe: ponding.
802*. Orthents						
865*. Pits						
2027C*: Miami----------	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Moderate: frost action, low strength.	Slight.
Urban land.						
2152*: Drummer----------	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Urban land.						
2154A*: Flanagan---------	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
Urban land.						
2171B*: Catlin----------	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
Urban land.						

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2198A*:						
Elburn	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
Urban land.						
2236A*:						
Sabina	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
Urban land.						
2481A*:						
Raub	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
Urban land.						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Area sanitary landfill	Daily cover for landfill
23A, 23B---------- Blount	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: wetness.
27B---------- Miami	Severe: percs slowly.	Moderate: seepage, slope.	Slight----------	Fair: too clayey.
27C2---------- Miami	Severe: percs slowly.	Severe: slope.	Slight----------	Fair: too clayey.
27D2---------- Miami	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Fair: too clayey, slope.
27E2---------- Miami	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Poor: slope.
56B---------- Dana	Severe: wetness, percs slowly.	Severe: wetness.	Slight----------	Fair: too clayey, wetness.
67---------- Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
73---------- Ross	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Good.
91B---------- Swygert	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
102A---------- La Hogue	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: too sandy, wetness.
125---------- Selma	Severe: ponding.	Severe: seepage, ponding.	Severe: ponding.	Poor: ponding.
131B---------- Alvin	Slight----------	Severe: seepage.	Severe: seepage.	Fair: thin layer.
134B---------- Camden	Slight----------	Moderate: seepage, slope.	Slight----------	Fair: too clayey.
146B---------- Elliott	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: wetness.
148B---------- Proctor	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey, wetness.
149A---------- Brenton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
150B---------- Onarga	Slight----------	Severe: seepage.	Severe: seepage.	Poor: thin layer.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Area sanitary landfill	Daily cover for landfill
152--Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
153--Pella	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
154A--Flanagan	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
171B--Catlin	Severe: wetness.	Moderate: seepage, slope, excess humus.	Moderate: wetness.	Poor: hard to pack.
194B--Morley	Severe: wetness, percs slowly.	Severe: wetness.	Slight	Fair: too clayey, wetness.
194C2--Morley	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: slope.	Fair: too clayey, slope, wetness.
194D2--Morley	Severe: wetness, percs slowly, slope.	Severe: slope, wetness.	Severe: slope.	Poor: slope.
198A--Elburn	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
199B--Plano	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
206--Thorp	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
219--Millbrook	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
221B--Parr	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Good.
221C2--Parr	Moderate: percs slowly.	Severe: slope.	Slight	Good.
221D3--Parr	Moderate: slope, percs slowly.	Severe: slope.	Moderate: slope.	Fair: slope.
223B2--Varna	Severe: wetness, percs slowly.	Severe: wetness.	Slight	Fair: too clayey, wetness.
223C3--Varna	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: slope.	Fair: too clayey, slope, wetness.
232--Ashkum	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Poor: ponding.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Area sanitary landfill	Daily cover for landfill
233B---------- Birkbeck	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
234A---------- Sunbury	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
235---------- Bryce	Severe: ponding, percs slowly.	Slight----------	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
236A---------- Sabina	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: wetness.
241D---------- Chatsworth	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Poor: too clayey, hard to pack.
242A---------- Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
243B---------- St. Charles	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
291B---------- Xenia	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
302---------- Ambraw	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
322C2---------- Russell	Moderate: percs slowly.	Severe: slope.	Slight----------	Fair: too clayey.
330---------- Peotone	Severe: ponding, percs slowly.	Slight----------	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
387B---------- Ockley	Slight----------	Severe: seepage.	Slight----------	Poor: small stones.
387C3---------- Ockley	Moderate: slope.	Severe: seepage, slope.	Moderate: slope.	Poor: small stones.
398A---------- Wea	Slight----------	Moderate: seepage.	Slight----------	Fair: too clayey.
402---------- Colo	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Poor: wetness, hard to pack.
440B---------- Jasper	Slight----------	Moderate: seepage, slope.	Slight----------	Fair: too clayey.
440C2---------- Jasper	Slight----------	Severe: slope.	Slight----------	Fair: too clayey.
448B----------	Severe:	Severe:	Slight----------	Poor:

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Area sanitary landfill	Daily cover for landfill
481A---------- Raub	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
490A---------- Odell	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: wetness.
533*. Urban land				
570B---------- Martinsville	Slight----------	Moderate: seepage, slope.	Slight----------	Fair: too clayey, thin layer.
570C2---------- Martinsville	Slight----------	Severe: slope.	Slight----------	Fair: too clayey, thin layer.
570D2---------- Martinsville	Moderate: slope.	Severe: slope.	Moderate: slope.	Fair: too clayey, slope, thin layer.
637---------- Muskego	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding.	Poor: ponding, excess humus.
802*. Orthents				
865*. Pits				
2027C*: Miami----------	Severe: percs slowly.	Severe: slope.	Slight----------	Fair: too clayey.
Urban land.				
2152*: Drummer----------	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Urban land.				
2154A*: Flanagan----------	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
Urban land.				
2171B*: Catlin----------	Severe: wetness.	Moderate: seepage, slope, excess humus.	Moderate: wetness.	Poor: hard to pack.
Urban land.				
2198A*: Elburn----------	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
Urban land.				

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Area sanitary landfill	Daily cover for landfill
2236A*:				
Sabina	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Urban land.				
2481A*:				
Raub	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
Urban land.				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
23A, 23B Blount	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
27B, 27C2 Miami	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.
27D2 Miami	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, slope.
27E2 Miami	Fair: slope, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
56B Dana	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
67 Harpster	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
73 Ross	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
91B Swygert	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
102A La Hogue	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
125 Selma	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
131B Alvin	Good	Probable	Improbable: too sandy.	Good.
134B Camden	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
146B Elliott	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
148B Proctor	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
149A Brenton	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
150B Onarga	Good	Probable	Improbable: too sandy.	Fair: area reclaim, thin layer.
152 Drummer	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
153 Pella	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
154A Flanagan	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
171B---------- Catlin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
194B, 194C2---------- Morley	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
194D2---------- Morley	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
198A---------- Elburn	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
199B---------- Plano	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
206---------- Thorp	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
219---------- Millbrook	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
221B, 221C2---------- Parr	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
221D3---------- Parr	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
223B2, 223C3---------- Varna	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
232---------- Ashkum	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
233B---------- Birkbeck	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
234A---------- Sunbury	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
235---------- Bryce	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
236A---------- Sabina	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
241D---------- Chatsworth	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
242A---------- Kendall	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
243B---------- St. Charles	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
291B---------- Xenia	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
302---------- Ambraw	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
322C2---------- Russell	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
330--- Peotone	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
387B, 387C3--- Ockley	Good---	Probable---	Probable---	Poor: small stones, area reclaim.
398A--- Wea	Good---	Probable---	Probable---	Fair: small stones.
402--- Colo	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
440B, 440C2--- Jasper	Good---	Improbable: excess fines.	Improbable: excess fines.	Good.
448B--- Mona	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, thin layer.
481A--- Raub	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
490A--- Odell	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
533*. Urban land				
570B, 570C2--- Martinsville	Good---	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
570D2--- Martinsville	Good---	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
637--- Muskego	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, wetness.
802*. Orthents				
865*. Pits				
2027C*: Miami---	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.
Urban land.				
2152*: Drummer---	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Urban land.				
2154A*: Flanagan---	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2154A*: Urban land.				
2171B*: Catlin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
2198A*: Elburn	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
2236A*: Sabina	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
2481A*: Raub	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir	Embankments, dikes, and	Drainage	Irrigation	Terraces and	Grassed
23A---------- Blount	Slight---------	Moderate: piping, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily.
23B---------- Blount	Moderate: slope.	Moderate: piping, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily.
27B, 27C2---------- Miami	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Erodes easily	Erodes easily.
27D2, 27E2-------- Miami	Severe: slope.	Severe: piping.	Deep to water	Slope----------	Slope, erodes easily.	Slope, erodes easily.
56B---------- Dana	Moderate: seepage, slope.	Moderate: thin layer.	Deep to water	Slope----------	Erodes easily	Erodes easily.
67---------- Harpster	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
73---------- Ross	Severe: seepage.	Severe: piping.	Deep to water	Flooding-------	Favorable------	Favorable.
91B---------- Swygert	Moderate: slope.	Severe: wetness.	Percs slowly, frost action, slope.	Wetness, droughty, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, droughty.
102A---------- La Hogue	Severe: seepage.	Severe: piping, wetness.	Frost action, cutbanks cave.	Wetness--------	Wetness, too sandy.	Wetness.
125---------- Selma	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
131B---------- Alvin	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, slope.	Soil blowing---	Favorable.
134B---------- Camden	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
146B---------- Elliott	Moderate: slope.	Moderate: piping, wetness.	Frost action, slope.	Wetness, slope.	Wetness--------	Wetness.
148B---------- Proctor	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily.
149A----------	Moderate:	Severe:	Frost action,	Wetness--------	Wetness,	Wetness.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
154A---------- Flanagan	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
171B---------- Catlin	Moderate: seepage, slope.	Moderate: hard to pack, wetness.	Deep to water	Slope----------	Erodes easily	Erodes easily.
194B---------- Morley	Moderate: slope.	Moderate: piping.	Deep to water	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
194C2, 194D2------ Morley	Severe: slope.	Moderate: piping.	Deep to water	Percs slowly, slope.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
198A---------- Elburn	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
199B---------- Plano	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Deep to water	Slope----------	Erodes easily	Erodes easily.
206---------- Thorp	Slight---------	Severe: ponding.	Percs slowly, flooding, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
219---------- Millbrook	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
221B, 221C2------- Parr	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
221D3---------- Parr	Severe: slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
223B2---------- Varna	Moderate: slope.	Moderate: piping.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.
223C3---------- Varna	Severe: slope.	Moderate: piping.	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
232---------- Ashkum	Slight---------	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
233B---------- Birkbeck	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
234A---------- Sunbury	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
235---------- Bryce	Slight---------	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, droughty, slow intake.	Ponding, percs slowly.	Wetness, droughty, rooting depth.
236A---------- Sabina	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
241D---------- Chatsworth	Severe: slope.	Moderate: hard to pack.	Deep to water	Droughty, slow intake, percs slowly.	Slope, percs slowly.	Slope, droughty.
242A---------- Kendall	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
243B---------- St. Charles	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
291B---------- Xenia	Moderate: seepage, slope.	Moderate: thin layer, wetness.	Frost action, slope.	Wetness, slope, erodes easily.	Erodes easily, wetness.	Erodes easily.
302---------- Ambraw	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Wetness--------	Wetness.
322C2---------- Russell	Moderate: seepage, slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
330---------- Peotone	Slight---------	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
387B---------- Ockley	Moderate: seepage, slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
387C3---------- Ockley	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
398A---------- Wea	Moderate: seepage.	Moderate: thin layer.	Deep to water	Favorable------	Erodes easily	Erodes easily.
402---------- Colo	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Flooding, wetness.	Wetness--------	Wetness.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
2152*:						
Drummer	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
Urban land.						
2154A*:						
Flanagan	Moderate: seepage.	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
Urban land.						
2171B*:						
Catlin	Moderate: seepage, slope.	Moderate: hard to pack, wetness.	Deep to water	Slope	Erodes easily	Erodes easily.
Urban land.						
2198A*:						

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
23A, 23B--------- Blount	0-11	Silt loam---------	CL	A-6, A-4	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	11-40	Silty clay loam, silty clay, clay loam.	CH, CL	A-7, A-6	0-5	95-100	90-100	90-100	80-95	35-60	15-35
	40-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-10	90-100	90-100	80-100	70-90	30-45	10-25
27B, 27C2, 27D2, 27E2---------- Miami	0-8	Silt loam---------	CL, CL-ML	A-4, A-6	0	100	95-100	80-100	50-90	22-34	6-15
	8-24	Clay loam, silty clay loam, loam.	CL	A-6, A-7	0	92-99	89-97	78-95	64-95	35-50	17-31
	24-60	Loam, clay loam, sandy loam.	CL, CL-ML, ML	A-4, A-6	0-3	88-94	83-89	74-87	50-64	20-40	2-20
56B---------- Dana	0-12	Silt loam---------	CL	A-6, A-4	0	100	100	95-100	85-95	30-35	8-12
	12-34	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-98	38-50	20-32
	34-39	Clay loam---------	CL	A-6, A-7	0	90-100	90-95	80-90	65-75	37-50	17-30
	39-60	Loam----------	CL, ML, CL-ML	A-4, A-6	0-3	85-95	80-90	75-85	50-65	17-30	2-14
67---------- Harpster	0-11	Silty clay loam	CL, CH	A-7	0	100	95-100	95-100	90-100	45-60	20-35
	11-41	Silty clay loam, silt loam, loam.	CL, CH	A-7	0	100	95-100	95-100	80-100	40-60	20-35
	41-60	Stratified loam to silt loam.	CL, CL-ML, SC, SM-SC	A-6, A-4, A-7	0	100	95-100	95-100	45-95	20-50	5-25
73---------- Ross	0-21	Silt loam---------	ML, CL-ML, CL	A-4, A-6	0	90-100	90-100	80-100	65-95	20-35	NP-12
	21-55	Loam, silt loam, silty clay loam.	ML, CL, CL-ML	A-6, A-4, A-7	0	90-100	85-100	70-100	55-95	22-45	3-20
	55-63	Stratified gravelly sandy loam to loam.	CL, ML, SM, GM	A-6, A-4, A-2, A-1	0-5	65-100	55-100	35-100	20-80	<30	NP-12
91B---------- Swygert	0-12	Silty clay loam	CL, CH, ML	A-7, A-6	0	100	95-100	95-100	85-95	35-55	16-30
	12-38	Silty clay, clay	CH	A-7	0-5	95-100	95-100	90-100	75-95	50-60	25-35
	38-60	Silty clay loam, silty clay, clay.	CH, CL	A-7, A-6	0-5	85-100	80-100	80-100	75-95	35-65	15-40
102A---------- La Hogue	0-16	Loam----------	ML, CL, CL-ML	A-4	0	100	95-100	80-100	50-80	20-35	3-10
	16-43	Sandy clay loam, sandy loam, clay loam.	CL, SC	A-6, A-4	0	100	100	80-100	40-85	25-40	8-20
	43-73	Stratified sand to silt loam.	CL, CL-ML, SC, SM-SC	A-4, A-2	0	90-100	80-100	50-95	20-60	<25	5-10
125---------- Selma	0-13	Loam----------	CL	A-4, A-6	0	100	98-100	80-98	55-85	25-35	7-17
	13-46	Sandy loam, loam, silty clay loam.	CL, SC	A-6	0	100	95-100	80-95	38-85	24-36	11-19
	46-73	Stratified sand to silt loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	90-100	85-100	60-90	30-70	15-35	5-20
131B---------- Alvin	0-20	Sandy loam-------	SM, ML	A-4, A-2	0	100	100	80-95	30-60	<25	NP-4
	20-66	Loamy sand, loam, sandy loam, sandy clay loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	100	100	90-100	20-80	15-38	NP-13

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
134B---------- Camden	0-14	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0	100	100	95-100	90-100	20-35	3-15
	14-35	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	90-100	25-40	15-25
	35-62	Clay loam, sandy loam, loam.	ML, SC, SM, CL	A-2, A-4, A-6	0-5	90-100	85-100	60-90	30-70	20-40	3-15
	62-77	Stratified sandy loam to loam.	SM, SC, ML, CL	A-2, A-4	0-5	90-100	80-100	50-80	20-60	<25	3-10
146B---------- Elliott	0-12	Silt loam--------	CL	A-6, A-4	0	95-100	95-100	95-100	80-100	30-40	8-18
	12-41	Silty clay, silty clay loam.	CH, CL	A-6, A-7	0-5	95-100	95-100	90-100	75-100	30-52	11-26
	41-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-5	95-100	95-100	90-100	70-95	28-45	11-24
148B---------- Proctor	0-14	Silt loam--------	CL	A-6	0	100	100	95-100	85-100	25-40	10-22
	14-44	Silty clay loam, clay loam, loam.	CL	A-7, A-6	0	95-100	90-100	85-100	65-90	25-50	10-25
	44-66	Stratified loam to sand.	SC, CL, SM-SC, CL-ML	A-2, A-4, A-6	0	85-100	80-100	50-100	25-80	20-40	5-20
149A---------- Brenton	0-16	Silt loam--------	CL, ML	A-6, A-4	0	100	95-100	95-100	80-100	30-40	8-15
	16-35	Silty clay loam	CL, ML	A-6, A-7	0	100	95-100	95-100	75-95	35-50	10-25
	35-60	Stratified loamy sand to silty clay loam.	CL-ML, CL, SM-SC, SC	A-4, A-6, A-2	0	95-100	85-100	80-100	30-85	20-35	5-20
150B---------- Onarga	0-12	Sandy loam-------	SC, SM, SM-SC	A-4, A-6, A-2	0	100	100	75-95	25-50	5-28	NP-12
	12-49	Sandy loam, loam, sandy clay loam. sandy clay loam.	SC, CL, SM-SC, CL-ML	A-4, A-6, A-2-4	0	95-100	95-100	75-95	30-60	19-32	5-14
	49-65	Stratified sand to sandy loam.	SM, SP-SM, SM-SC	A-2, A-4	0	85-100	80-100	70-95	12-50	<20	NP-6
152---------- Drummer	0-14	Silty clay loam	CL, CH	A-6, A-7	0	100	95-100	95-100	80-95	30-55	15-30
	14-41	Silty clay loam	CL	A-6, A-7	0	100	95-100	95-100	85-95	30-50	15-30
	41-47	Loam, silt loam, clay loam.	CL	A-6, A-7	0-5	95-100	90-100	75-95	60-85	30-50	15-30
	47-60	Stratified sandy loam to silty clay loam.	SC, CL	A-4, A-6	0-5	95-100	85-95	75-95	45-80	20-35	7-20
153---------- Pella	0-15	Silty clay loam	CL	A-6, A-7	0	100	95-100	85-100	75-95	30-50	15-30
	15-26	Silty clay loam, silt loam, clay loam.	CL	A-6, A-7	0	100	95-100	85-100	75-95	30-50	15-30
	26-34	Stratified silty clay loam to sandy loam.	CL	A-6, A-7	0-5	95-100	90-100	75-95	60-90	25-45	10-25
	34-60	Stratified loamy sand to silty clay loam.	SM-SC, SC, CL, CL-ML	A-2, A-4, A-6	0-5	90-100	80-100	50-100	30-85	20-35	7-20
154A---------- Flanagan	0-18	Silt loam--------	CL	A-7, A-6	0	100	100	95-100	85-100	35-50	15-30
	18-45	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-100	40-60	15-30
	45-60	Loam, clay loam, silt loam.	CL, SC, CL-ML, SM-SC	A-4, A-6, A-7	0	85-100	80-100	70-95	36-85	20-45	5-30
171B---------- Catlin	0-13	Silt loam--------	ML, CL, OL	A-6, A-7	0	100	100	95-100	85-100	30-50	11-20
	13-44	Silty clay loam	CL, CH	A-7, A-6	0	100	100	90-100	80-100	35-55	20-30
	44-60	Loam, silt loam, clay loam.	CL	A-6, A-7	0	90-100	90-100	85-100	60-100	25-45	11-20

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
194B, 194C2, 194D2----------	0-6	Silt loam--------	CL, CL-ML	A-6, A-4	0-5	95-100	95-100	90-100	85-95	25-40	5-15
Morley	6-10	Silty clay loam, clay loam.	CL	A-6, A-7	0-10	95-100	90-100	85-95	80-90	30-50	15-30
	10-34	Silty clay, clay loam, clay.	CL, CH	A-7	0-10	95-100	90-100	85-95	80-90	40-60	15-35
	34-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-10	95-100	90-100	85-95	80-90	30-50	15-30
198A----------	0-16	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	25-40	10-25
Elburn	16-46	Silty clay loam	CL	A-6, A-7	0	100	100	100	75-90	30-50	15-35
	46-60	Loam, sandy loam, sand.	CL, CL-ML, SC, SM-SC	A-6, A-4, A-2	0	90-100	80-100	60-90	25-80	20-40	5-20
199B----------	0-16	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-30	5-15
Plano	16-47	Silty clay loam	CL	A-6	0	100	100	95-100	95-100	25-40	10-25
	47-70	Stratified silt loam to sandy loam.	ML, SM, CL, SC	A-4, A-2	0-5	90-100	85-95	60-90	30-70	<25	NP-10
206----------	0-17	Silt loam--------	CL	A-6, A-4	0	100	100	95-100	85-95	25-40	8-20
Thorp	17-53	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	85-95	30-50	10-25
	53-64	Loam, silt loam, clay loam.	CL	A-6, A-4, A-7	0	90-100	70-100	90-100	70-90	30-45	8-20
219----------	0-14	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	95-100	80-100	20-35	5-15
Millbrook	14-35	Silty clay loam, clay loam.	CL	A-6, A-7	0	100	100	95-100	75-98	30-45	10-25
	35-60	Stratified sand to clay loam.	SM, SC, CL, ML	A-4, A-6, A-2	0-5	95-100	90-100	70-95	30-85	<30	NP-15
221B, 221C2------	0-10	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	95-100	80-100	50-90	18-30	4-10
Parr	10-27	Clay loam, loam	CL	A-6, A-7	0	90-100	90-95	80-90	65-75	25-35	8-15
	27-60	Loam----------	CL, ML, CL-ML	A-4, A-6	0-3	85-95	80-90	75-85	50-65	<25	2-8
221D3----------	0-4		CL, CL-ML	A-4, A-6	0	100	95-100	80-100	50-90	30-35	10-15
Parr	4-20	Clay loam, loam	CL	A-6, A-7	0	90-100	90-95	80-90	65-75	25-35	8-15
	20-60	Loam----------	CL, ML, CL-ML	A-4, A-6	0-3	85-95	80-90	75-85	50-65	<25	2-8
223B2----------	0-11	Silt loam--------	CL	A-6, A-4	0-5	95-100	95-100	95-100	85-95	25-40	8-20
Varna	11-31	Silty clay, silty clay loam, clay.	CL, CH	A-7, A-6	0-10	95-100	85-100	85-98	80-98	35-56	15-29
	31-60	Silty clay loam, clay loam.	CL	A-7, A-6	0-10	95-100	85-100	85-98	80-95	30-45	13-26
223C3----------	0-8	Silty clay loam	CL	A-6, A-7	0-10	95-100	85-100	85-98	80-95	30-50	12-25
Varna	8-20	Silty clay, silty clay loam, clay.	CL, CH	A-7, A-6	0-10	95-100	85-100	85-98	80-98	35-56	15-29
	20-60	Silty clay loam,	CL	A-7, A-6	0-10	95-100	85-100	85-98	80-95	30-45	13-26

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
234A---------- Sunbury	0-9	Silt loam--------	ML, CL, OL	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	8-15
	9-43	Silty clay loam	CL, CH	A-7, A-6	0	100	100	95-100	85-100	35-60	20-35
	43-65	Loam, silt loam, clay loam.	CL	A-4, A-6, A-7	0	98-100	95-100	90-100	70-100	30-45	8-20
235---------- Bryce	0-14	Silty clay-------	CH, CL	A-7	0	100	100	95-100	85-95	45-60	20-30
	14-50	Silty clay, clay	CH	A-7	0-5	95-100	95-100	95-100	75-95	50-60	25-35
	50-60	Silty clay, silty clay loam, clay.	CH, CL	A-7	0-5	95-100	90-100	90-100	75-95	40-65	20-40
236A---------- Sabina	0-13	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	13-42	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	85-100	35-50	11-25
	42-60	Loam, silty clay loam, silt loam.	CL	A-4, A-6, A-7	0-5	95-100	90-100	70-100	55-75	25-45	8-20
241D---------- Chatsworth	0-8	Silty clay-------	CH	A-7	0	100	100	95-100	90-100	50-65	25-35
	8-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	90-100	45-75	20-45
242A---------- Kendall	0-18	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	20-35	5-15
	18-41	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	41-60	Stratified sandy loam to silt loam.	CL, CL-ML, SM-SC, SC	A-2, A-4	0-5	90-100	80-90	60-90	30-70	<25	4-10
243B---------- St. Charles	0-8	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	95-100	22-35	7-15
	8-44	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	90-100	30-40	10-20
	44-60	Stratified silt loam to sandy loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0-5	90-100	80-90	60-90	30-70	15-35	5-15
291B---------- Xenia	0-10	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	25-35	5-15
	10-37	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	80-95	35-50	15-30
	37-57	Clay loam--------	CL	A-6, A-7	0-5	92-100	90-95	75-95	65-75	35-50	15-30
	57-72	Loam-------------	CL, ML, SC, SM	A-4, A-6	0-5	85-95	80-90	75-90	40-65	15-30	NP-15
302---------- Ambraw	0-15	Silty clay loam	ML, CL	A-6, A-7	0	100	100	85-95	70-95	35-45	10-18
	15-40	Clay loam, loam.	ML, CL	A-7, A-6	0	100	100	85-95	50-85	35-48	10-20
	40-60	Stratified clay loam to sand.	SC, ML, CL, SM	A-6, A-4	0	100	90-100	80-90	40-80	20-40	NP-17
322C2---------- Russell	0-11	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	95-100	80-100	50-90	20-35	5-15
	11-29	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	85-95	35-50	20-35
	29-51	Clay loam, loam	CL	A-6, A-7	0	90-100	90-95	80-90	65-75	35-50	17-31
	51-72	Loam, clay loam	CL, ML, CL-ML	A-4, A-6	0-3	85-95	80-90	75-85	50-65	<30	2-14
330---------- Peotone	0-24	Silty clay loam	CH, CL	A-7	0	100	95-100	95-100	80-100	40-65	15-35
	24-46	Silty clay loam, silty clay.	CH, CL	A-7	0-5	100	95-100	90-100	85-100	41-70	17-39
	46-70	Silty clay loam, silt loam, silty clay.	CL, CH, ML, MH	A-7, A-6	0-5	95-100	95-100	90-100	75-98	30-60	14-29

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
387B---------- Ockley	0-10	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0	100	95-100	80-100	60-90	22-33	3-12
	10-35	Silty clay loam, clay loam.	CL	A-6, A-7	0	100	75-100	65-90	50-90	35-50	15-30
	35-45	Gravelly clay loam, clay loam.	CL, SC, GC	A-6, A-7	0-2	70-85	45-75	40-70	35-55	30-50	15-30
	45-60	Stratified sand to gravelly sand.	SP, SP-SM, GP, GP-GM	A-1	1-5	30-70	20-55	5-20	2-10	---	NP
387C3---------- Ockley	0-6	Clay loam--------	CL	A-6, A-7	0	100	75-100	70-100	50-90	30-45	10-25
	6-14	Clay loam--------	CL	A-6, A-7	0	100	75-100	65-90	50-90	35-50	15-30
	14-41	Gravelly clay loam, gravelly sandy clay loam.	CL, SC, GC	A-6, A-7	0-2	70-85	45-75	40-70	35-55	30-50	15-30
	41-60	Stratified sand to gravelly sand.	SP, SP-SM, GP, GP-GM	A-1	1-5	30-70	20-55	5-20	2-10	---	NP
398A---------- Wea	0-15	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	25-35	5-15
	15-40	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	95-100	90-95	85-95	65-90	35-50	15-30
	40-62	Gravelly loam----	CL, SM-SC, SC, CL-ML	A-4, A-6	0-5	70-85	65-85	60-80	35-65	15-30	5-15
	62-70	Stratified sand to gravelly sand.	SP, SP-SM, GP, GP-GM	A-1	1-5	30-70	20-55	5-20	0-10	---	NP
402---------- Colo	0-9	Silty clay loam	CL, CH	A-7, A-6	0	100	100	90-100	90-100	40-60	15-30
	9-65	Silty clay loam, clay loam.	CL, CH	A-7	0	100	100	90-100	90-100	40-60	20-30
440B, 440C2------ Jasper	0-12	Loam----------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-90	25-35	5-15
	12-24	Sandy clay loam, clay loam.	SC, CL	A-6	0	100	100	80-95	45-85	20-35	10-20
	24-37	Sandy loam-------	SC, SM-SC	A-4, A-2-4	0	100	100	60-70	30-40	20-30	5-10
	37-60	Stratified silt to sand.	SC, CL-ML, CL, SM-SC	A-4	0	100	100	75-90	35-85	<30	5-10
448B---------- Mona	0-15	Silt loam--------	CL	A-4, A-6	0	100	95-100	95-100	85-100	25-40	8-20
	15-44	Clay loam, silty clay loam, sandy clay loam.	CL	A-6, A-7	0-5	95-100	85-95	75-90	60-85	35-50	11-25
	44-60	Silty clay, clay	CH, CL	A-7	0-10	95-100	85-95	80-95	75-90	40-60	15-32
481A---------- Raub	0-18	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	75-95	25-35	5-15
	18-32	Silty clay loam	CL, CH	A-6, A-7	0	100	100	95-100	80-95	35-55	20-35
	32-40	Clay loam, silty clay loam.	CL	A-6, A-7	0	95-100	90-100	85-95	60-85	35-50	15-25
	40-60	Loam, clay loam	CL, ML, SC, SM	A-4, A-6	0-5	85-95	80-90	70-85	40-65	15-30	NP-15
490A---------- Odell	0-11	Silt loam--------	ML, CL	A-4, A-6	0	100	100	90-100	70-95	30-40	8-14
	11-26	Clay loam, loam, silty clay loam.	CL	A-6, A-7	0	90-100	90-95	80-90	65-75	35-50	17-31
	26-60	Loam, clay loam	CL, ML	A-4, A-6	0-3	85-95	80-90	75-85	50-65	25-40	2-16
533*. Urban land											

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid	Plas-
570B---------- Martinsville	0-9	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	90-100	80-100	60-90	22-33	4-12
	9-33	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	100	90-100	65-90	40-90	20-35	8-20
	33-42	Silt loam, sandy clay loam, loam.	SM, ML	A-2-4, A-4	0	100	90-100	60-80	30-60	30-40	2-8
	42-72	Stratified sand to sandy clay loam.	CL, SC, CL-ML, SM-SC	A-4	0	95-100	85-100	80-95	40-60	<25	4-9
570C2, 570D2----- Martinsville	0-9	Loam----------	CL, CL-ML	A-4, A-6	0	100	90-100	80-100	60-90	22-33	4-12
	9-33	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	100	90-100	65-90	40-90	20-35	8-20
	33-42	Sandy loam, sandy clay loam, loam.	SM, ML	A-2-4, A-4	0	100	90-100	60-80	30-60	30-40	2-8
	42-72	Stratified sand to sandy clay loam.	CL, SC, CL-ML, SM-SC	A-4	0	95-100	85-100	80-95	40-60	<25	4-9
637----------	0-16	Silty clay loam	MH, CH, CL	A-6, A-7	0	100	100	95-100	85-95	35-60	15-30

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
2198A*:											
Elburn----------	0-16	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	25-40	10-25
	16-46	Silty clay loam	CL	A-6, A-7	0	100	100	100	75-90	30-50	15-35
	46-66	Loam, sandy loam, sand.	CL, CL-ML, SC, SM-SC	A-6, A-4, A-2	0	90-100	80-100	60-90	25-80	20-40	5-20
Urban land.											
2236A*:											
Sabina----------	0-13	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	13-42	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	85-100	35-50	11-25
	42-60	Clay loam, silty clay loam, silt loam.	CL	A-4, A-6, A-7	0-5	95-100	90-100	70-100	55-75	25-45	8-20
Urban land.											
2481A*:											
Raub----------	0-18	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	75-95	25-35	5-15
	18-32	Silty clay loam	CL, CH	A-6, A-7	0	100	100	95-100	80-95	35-55	20-35
	32-40	Clay loam, silty clay loam.	CL	A-6, A-7	0	95-100	90-100	85-95	60-85	35-50	15-25
	40-60	Loam, clay loam	CL, ML, SC, SM	A-4, A-6	0-5	85-95	80-90	70-85	40-65	15-30	NP-15
Urban land.											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cm^3	In/hr	In/in	pH					Pct
23A, 23B---	0-11	22-27	1.35-1.55	0.6-2.0	0.20-0.24	5.1-6.5	Low---	0.43	3	6	2-3
Blount	11-40	35-50	1.40-1.70	0.06-0.6	0.12-0.19	4.5-6.5	Moderate---	0.43			
	40-60	27-38	1.60-1.85	0.06-0.6	0.07-0.10	7.4-8.4	Moderate---	0.43			
27B, 27C2, 27D2, 27E2---	0-8	11-22	1.40-1.55	0.6-2.0	0.20-0.24	5.6-7.3	Low---	0.37	5	5	.5-3
Miami	8-24	25-35	1.45-1.65	0.6-2.0	0.15-0.20	5.6-6.0	Moderate---	0.37			
	24-60	15-28	1.55-1.90	0.2-2.0	0.05-0.19	6.6-8.4	Moderate---	0.37			
56B---	0-12	11-22	1.40-1.55	0.6-2.0	0.22-0.24	5.6-7.3	Low---	0.32	5	5	3-5
Dana	12-34	27-35	1.45-1.65	0.6-2.0	0.18-0.20	5.1-6.0	Moderate---	0.43			
	34-39	27-35	1.45-1.65	0.6-2.0	0.15-0.19	6.1-7.3	Moderate---	0.43			
	39-60	15-27	1.55-1.90	0.2-0.6	0.05-0.19	6.6-8.4	Low---	0.43			
67---	0-11	22-35	1.05-1.25	0.6-2.0	0.21-0.24	7.4-8.4	Moderate---	0.28	5	4L	5-6
Harpster	11-41	25-35	1.20-1.50	0.6-2.0	0.17-0.22	7.4-8.4	Moderate---	0.28			
	41-60	15-30	1.40-1.60	0.6-2.0	0.11-0.22	7.4-8.4	Low---	0.28			
73---	0-21	15-27	1.20-1.45	0.6-2.0	0.19-0.24	6.1-7.8	Low---	0.32	5	5	4-5
Ross	21-55	18-32	1.20-1.50	0.6-2.0	0.16-0.22	6.1-8.4	Low---	0.32			
	55-63	5-25	1.35-1.60	0.6-6.0	0.05-0.18	6.1-8.4	Low---	0.32			
91B---	0-12	27-42	1.25-1.50	0.2-0.6	0.18-0.22	5.6-6.5	Moderate---	0.43	3	7	4-5
Swygert	12-38	45-50	1.40-1.65	0.06-0.2	0.05-0.12	6.1-7.8	High---	0.32			
	38-60	38-60	1.60-1.75	<0.06	0.03-0.05	7.9-8.4	High---	0.32			
102A---	0-16	10-27	1.40-1.60	0.6-2.0	0.20-0.24	6.1-7.3	Low---	0.28	5	5	3-4
La Hogue	16-43	18-35	1.50-1.70	0.6-2.0	0.12-0.20	5.1-7.3	Moderate---	0.28			
	43-73	5-20	1.60-1.80	0.6-6.0	0.05-0.22	5.6-7.8	Low---	0.20			
125---	0-13	20-27	1.40-1.60	0.6-2.0	0.20-0.24	6.1-7.8	Low---	0.28	5	6	4-6
Selma	13-46	18-30	1.40-1.60	0.6-2.0	0.15-0.19	6.1-8.4	Moderate---	0.28			
	46-73	7-18	1.60-1.90	2.0-6.0	0.07-0.19	6.6-8.4	Low---	0.28			
131B---	0-20	10-15	1.45-1.65	2.0-6.0	0.14-0.20	5.1-6.5	Low---	0.24	5	3	.5-1
Alvin	20-66	15-18	1.45-1.65	0.6-6.0	0.12-0.20	4.5-6.0	Low---	0.24			
134B---	0-14	14-27	1.15-1.35	0.6-2.0	0.22-0.24	5.1-7.3	Low---	0.37	5	6	1-2
Camden	14-35	22-35	1.35-1.55	0.6-2.0	0.16-0.20	5.1-7.3	Moderate---	0.37			
	35-62	18-30	1.45-1.65	0.6-2.0	0.11-0.22	5.6-7.3	Low---	0.37			
	62-77	5-20	1.55-1.75	0.6-6.0	0.11-0.22	5.6-8.4	Low---	0.37			
146B---	0-12	24-27	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Moderate---	0.28	4	6	4-5
Elliott	12-41	35-45	1.30-1.60	0.2-0.6	0.11-0.20	5.6-7.8	Moderate---	0.28			
	41-60	27-35	1.50-1.70	0.2-0.6	0.14-0.20	7.4-8.4	Moderate---	0.28			
148B---	0-14	18-25	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Low---	0.32	5	6	3-4
Proctor	14-44	25-35	1.20-1.45	0.6-2.0	0.15-0.20	5.6-6.5	Moderate---	0.43			
	44-66	15-32	1.40-1.70	0.6-6.0	0.07-0.19	6.1-7.3	Low---	0.43			
149A---	0-16	20-27	1.25-1.50	0.6-2.0	0.22-0.24	6.1-7.3	Low---	0.28	5	6	4-5
Brenton	16-35	25-35	1.30-1.55	0.6-2.0	0.18-0.20	5.6-7.3	Moderate---	0.28			
	35-60	15-30	1.50-1.70	0.6-2.0	0.11-0.20	6.1-8.4	Low---	0.28			
150B---	0-12	10-15	1.15-1.45	0.6-6.0	0.13-0.22	5.6-6.5	Low---	0.20	4	3	2-4
Onarga	12-49	15-18	1.45-1.70	0.6-6.0	0.15-0.19	5.1-6.5	Low---	0.20			
	49-65	2-10	1.65-1.90	6.0-20	0.05-0.13	5.1-7.8	Low---	0.15			
152---	0-14	27-35	1.10-1.30	0.6-2.0	0.21-0.23	5.6-7.8	Moderate---	0.28	5	7	5-7
Drummer	14-41	27-35	1.20-1.45	0.6-2.0	0.21-0.24	5.6-7.8	Moderate---	0.28			
	41-47	22-33	1.30-1.55	0.6-2.0	0.17-0.20	6.1-8.4	Moderate---	0.28			
	47-60	15-32	1.40-1.70	0.6-2.0	0.11-0.19	6.6-8.4	Low---	0.28			

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cm³	In/hr	In/in	pH					Pct
153----------	0-15	27-35	1.10-1.30	0.6-2.0	0.21-0.23	6.1-7.8	Moderate-----	0.28	5	7	5-6
Pella	15-26	25-35	1.20-1.45	0.6-2.0	0.21-0.24	6.6-7.8	Moderate-----	0.28			
	26-34	15-30	1.35-1.60	0.6-2.0	0.15-0.20	7.4-8.4	Moderate-----	0.28			
	34-60	15-30	1.40-1.70	0.6-2.0	0.10-0.22	7.4-8.4	Low----------	0.28			
154A----------	0-18	20-30	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.3	Moderate-----	0.28	5	6	4-5
Flanagan	18-45	35-42	1.35-1.55	0.2-0.6	0.15-0.22	5.6-7.3	High---------	0.43			
	45-60	20-30	1.45-1.70	0.2-0.6	0.15-0.22	6.1-8.4	Low----------	0.43			
171B----------	0-13	18-27	1.15-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.32	5	6	3-4
Catlin	13-44	27-35	1.25-1.55	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	44-60	20-30	1.40-1.70	0.6-2.0	0.07-0.11	6.1-8.4	Low----------	0.43			
194B, 194C2, 194D2----------	0-6	22-27	1.35-1.55	0.6-2.0	0.20-0.24	5.1-6.5	Low----------	0.43	3	6	2-3
Morley	6-10	27-40	1.45-1.65	0.2-0.6	0.18-0.20	5.1-6.5	Moderate-----	0.43			
	10-34	35-50	1.55-1.70	0.2-0.6	0.11-0.15	5.6-6.5	Moderate-----	0.43			
	34-60	27-40	1.60-1.80	0.06-0.6	0.07-0.12	6.6-8.4	Moderate-----	0.43			
198A----------	0-16	22-27	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.28	5	6	4-5
Elburn	16-46	27-35	1.20-1.40	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.43			
	46-60	15-25	1.50-1.70	0.6-6.0	0.12-0.18	6.1-8.4	Low----------	0.43			
199B----------	0-16	18-27	1.10-1.30	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.32	5	6	4-5
Plano	16-47	27-35	1.20-1.40	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	47-70	10-20	1.50-1.70	0.6-2.0	0.11-0.22	6.6-8.4	Low----------	0.43			
206----------	0-17	18-27	1.30-1.50	0.2-0.6	0.22-0.24	5.1-7.3	Low----------	0.37	4	6	3-5
Thorp	17-53	27-35	1.35-1.55	0.06-0.2	0.18-0.20	5.6-6.5	Moderate-----	0.37			
	53-64	20-30	1.40-1.60	0.06-0.2	0.15-0.22	6.6-7.3	Low----------	0.37			
219----------	0-14	18-27	1.40-1.60	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	6	2-4
Millbrook	14-35	27-35	1.45-1.65	0.6-2.0	0.15-0.20	5.6-7.3	Moderate-----	0.43			
	35-60	10-25	1.50-1.75	0.6-2.0	0.11-0.22	6.1-8.4	Low----------	0.32			
221B, 221C2------	0-10	12-22	1.30-1.45	0.6-2.0	0.21-0.24	5.6-7.3	Low----------	0.32	5	5	3-5
Parr	10-27	20-30	1.40-1.55	0.6-2.0	0.15-0.19	5.6-6.5	Moderate-----	0.32			
	27-60	8-20	1.40-1.60	0.6-2.0	0.05-0.19	7.4-8.4	Low----------	0.32			
221D3----------	0-4	25-30	1.30-1.45	0.6-2.0	0.21-0.24	5.6-7.3	Low----------	0.32	4	5	1-2
Parr	4-20	20-30	1.40-1.55	0.6-2.0	0.15-0.19	5.6-6.5	Moderate-----	0.32			
	20-60	8-20	1.40-1.60	0.6-2.0	0.05-0.19	7.4-8.4	Low----------	0.32			
223B2----------	0-11	20-30	1.10-1.30	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.32	4	6	3-4
Varna	11-31	35-48	1.30-1.60	0.06-0.6	0.09-0.19	5.6-7.3	Moderate-----	0.32			
	31-60	27-40	1.50-1.70	0.2-0.6	0.14-0.20	6.6-8.4	Low----------	0.32			
223C3----------	0-8	27-35	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.3	Moderate-----	0.32	3	7	2-3
Varna	8-20	35-48	1.30-1.60	0.06-0.6	0.09-0.19	5.6-7.3	Moderate-----	0.32			
	20-60	27-40	1.50-1.70	0.2-0.6	0.14-0.20	6.6-8.4	Low----------	0.32			
232----------	0-17	35-45	1.20-1.40	0.2-0.6	0.12-0.23	5.6-7.8	High---------	0.28	5	4	5-7
Ashkum	17-39	35-45	1.30-1.60	0.2-0.6	0.11-0.20	5.6-7.8	High---------	0.28			
	39-60	30-40	1.55-1.70	0.2-0.6	0.18-0.20	6.1-8.4	Moderate-----	0.28			
233B----------	0-11	20-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-6.5	Low----------	0.37	5	6	1-3
Birkbeck	11-46	25-35	1.30-1.50	0.6-2.0	0.18-0.22	5.1-6.5	Moderate-----	0.37			
	46-70	20-30	1.40-1.60	0.6-2.0	0.14-0.20	5.6-7.8	Low----------	0.37			
234A----------	0-9	20-27	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	6	2-4
Sunbury	9-43	36-40	1.35-1.55	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.43			
	43-65	20-30	1.40-1.60	0.6-2.0	0.07-0.11	7.4-8.4	Low----------	0.43			
235----------	0-14	35-48	1.30-1.50	0.2-0.6	0.12-0.21	5.6-7.8	High---------	0.28	3	4	5-7
Bryce	14-50	42-48	1.35-1.60	0.06-0.2	0.09-0.13	6.6-8.4	High---------	0.28			
	50-60	38-60	1.60-1.75	0.06-0.2	0.03-0.05	7.4-8.4	High---------	0.28			

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cm3	In/hr	In/in	pH					Pct
236A----------	0-13	20-27	1.25-1.45	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
Sabina	13-42	35-42	1.35-1.55	0.2-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	42-60	25-35	1.40-1.60	0.2-2.0	0.07-0.11	7.4-8.4	Low----------	0.37			
241D----------	0-8	40-60	1.30-1.50	<0.06	0.06-0.07	5.6-7.8	Moderate-----	0.32	2	4	5-1
Chatsworth	8-60	35-60	1.50-1.70	<0.06	0.05-0.07	6.1-8.4	Moderate-----	0.32			
242A----------	0-18	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
Kendall	18-41	27-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	41-60	10-25	1.55-1.70	0.6-2.0	0.11-0.22	5.1-8.4	Low----------	0.37			
243B----------	0-8	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-6.5	Low----------	0.37	5-4	6	1-3
St. Charles	8-44	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.37			
	44-60	10-25	1.55-1.75	0.6-2.0	0.11-0.22	5.6-7.8	Low----------	0.37			
291B----------	0-10	11-22	1.40-1.55	0.6-2.0	0.22-0.24	6.6-7.3	Low----------	0.37	5	5	1-3
Xenia	10-37	27-35	1.45-1.65	0.2-0.6	0.18-0.20	5.1-6.0	Moderate-----	0.37			
	37-57	27-35	1.45-1.65	0.2-0.6	0.15-0.19	5.1-7.3	Moderate-----	0.37			
	57-72	20-27	1.55-1.90	0.2-2.0	0.05-0.19	7.9-8.4	Low----------	0.37			
302----------	0-15	25-35	1.40-1.60	0.6-2.0	0.17-0.23	5.6-7.3	Moderate-----	0.28	5	6	2-3
Ambraw	15-40	24-35	1.45-1.65	0.2-2.0	0.15-0.19	5.6-7.3	Moderate-----	0.28			
	40-60	18-30	1.50-1.70	0.2-2.0	0.11-0.22	6.1-8.4	Low----------	0.28			
322C2----------	0-11	11-25	1.30-1.45	0.6-2.0	0.21-0.24	5.6-7.3	Low----------	0.37	5	5	.5-2
Russell	11-29	25-33	1.40-1.60	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.37			
	29-51	23-33	1.40-1.60	0.6-2.0	0.15-0.19	5.6-7.3	Moderate-----	0.37			
	51-72	14-30	1.60-1.80	0.6-2.0	0.05-0.19	7.4-8.4	Low----------	0.37			
330----------	0-24	33-40	1.20-1.40	0.2-0.6	0.12-0.23	6.1-7.8	High---------	0.28	5	4	5-7
Peotone	24-46	35-45	1.30-1.60	0.2-0.6	0.11-0.20	6.1-7.8	High---------	0.28			
	46-70	25-42	1.40-1.65	0.2-0.6	0.18-0.20	6.6-8.4	High---------	0.28			
387B----------	0-10	11-22	1.30-1.45	0.6-2.0	0.20-0.24	5.6-6.5	Low----------	0.37	5	5	1-3
Ockley	10-35	27-35	1.45-1.60	0.6-2.0	0.15-0.20	4.5-6.0	Moderate-----	0.37			
	35-45	20-35	1.40-1.55	0.6-2.0	0.12-0.14	5.6-6.5	Moderate-----	0.24			
	45-60	2-5	1.60-1.80	>20	0.02-0.04	7.4-8.4	Low----------	0.10			
387C3----------	0-6	27-30	1.30-1.45	0.6-2.0	0.17-0.23	4.5-6.5	Moderate-----	0.37	4	7	.5-1
Ockley	6-14	27-35	1.45-1.60	0.6-2.0	0.15-0.20	4.5-6.0	Moderate-----	0.37			
	14-41	20-35	1.40-1.55	0.6-2.0	0.12-0.14	5.6-6.5	Moderate-----	0.24			
	41-60	2-5	1.60-1.80	>20	0.02-0.04	7.4-8.4	Low----------	0.10			
398A----------	0-15	18-27	1.30-1.45	0.6-2.0	0.20-0.24	5.1-6.5	Low----------	0.32	5	5	4-5
Wea	15-40	20-35	1.40-1.60	0.6-2.0	0.15-0.20	5.1-6.5	Moderate-----	0.43			
	40-62	15-25	1.35-1.50	0.6-2.0	0.10-0.12	6.1-8.4	Low----------	0.24			
	62-70	1-7	1.50-1.75	>20	0.02-0.04	7.4-8.4	Low----------	0.10			
402----------	0-9	27-32	1.28-1.32	0.6-2.0	0.21-0.23	5.6-7.3	High---------	0.28	5	7	5-7
Colo	9-65	30-35	1.25-1.35	0.6-2.0	0.18-0.20	6.1-7.3	High---------	0.28			
440B, 440C2------	0-12	10-22	1.30-1.45	0.6-2.0	0.20-0.24	5.1-6.5	Low----------	0.28	5	5	3-5
Jasper	12-24	20-32	1.40-1.60	0.6-2.0	0.16-0.18	5.1-6.0	Low----------	0.28			
	24-37	12-20	1.40-1.60	0.6-2.0	0.14-0.16	5.6-7.3	Low----------	0.28			
	37-60	5-20	1.50-1.70	0.6-2.0	0.19-0.21	7.4-7.8	Low----------	0.28			
448B----------	0-15	20-27	1.10-1.30	0.6-2.0	0.22-0.24	6.1-7.8	Low----------	0.28	4	6	3-5

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cm³	In/hr	In/in	pH					Pct
533*. Urban land											
570B, 570C2, 570D2---------- Martinsville	0-9	8-17	1.30-1.45	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.37	5	5	1-3
	9-33	18-30	1.40-1.60	0.6-2.0	0.17-0.20	5.1-6.0	Moderate-----	0.37			
	33-42	10-25	1.40-1.60	0.6-2.0	0.12-0.14	5.6-6.5	Low----------	0.24			
	42-72	3-23	1.50-1.70	0.6-2.0	0.19-0.21	7.4-8.4	Low----------	0.24			
637---------- Muskego	0-16	27-35	0.80-1.10	0.6-2.0	0.15-0.23	6.1-7.3	High---------	0.28	5	7	7-19
	16-50	2-4	0.10-0.21	0.2-6.0	0.35-0.45	5.6-7.3	----------	----			
	50-70	---	0.10-0.40	0.06-0.2	0.18-0.24	6.6-8.4	----------	----			
802*. Orthents											
865*. Pits											
2027C*: Miami----------	0-8	11-22	1.40-1.55	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.37	5	5	.5-3
	8-24	25-35	1.45-1.65	0.6-2.0	0.15-0.20	5.6-6.0	Moderate-----	0.37			
	24-60	15-28	1.55-1.90	0.2-2.0	0.05-0.19	6.6-8.4	Moderate-----	0.37			
Urban land.											
2152*: Drummer---------	0-14	27-35	1.10-1.30	0.6-2.0	0.21-0.23	5.6-7.8	Moderate-----	0.28	5	7	5-7
	14-41	27-35	1.20-1.45	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28			
	41-47	22-33	1.30-1.55	0.6-2.0	0.17-0.20	6.1-8.4	Moderate-----	0.28			
	47-60	15-32	1.40-1.70	0.6-2.0	0.11-0.19	6.6-8.4	Low----------	0.28			
Urban land.											
2154A*: Flanagan--------	0-18	20-30	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.3	Moderate-----	0.28	5	6	4-5
	18-45	35-42	1.35-1.55	0.2-0.6	0.15-0.22	5.6-7.3	High---------	0.43			
	45-60	20-30	1.45-1.70	0.2-0.6	0.15-0.22	6.1-8.4	Low----------	0.43			
Urban land.											
2171B*: Catlin----------	0-13	18-27	1.15-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.32	5	6	3-4
	13-44	27-35	1.25-1.55	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	44-60	20-30	1.40-1.70	0.6-2.0	0.07-0.11	6.1-8.4	Low----------	0.43			
Urban land.											
2198A*: Elburn----------	0-16	22-27	1.10-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.28	5	6	4-5
	16-46	27-35	1.20-1.40	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.43			
	46-66	15-25	1.50-1.70	0.6-6.0	0.12-0.18	6.1-8.4	Low----------	0.43			
Urban land.											
2236A*: Sabina----------	0-13	20-27	1.25-1.45	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	13-42	35-42	1.35-1.55	0.2-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	42-60	25-35	1.40-1.60	0.2-2.0	0.07-0.11	7.4-8.4	Low----------	0.37			
Urban land.											
2481A*: Raub----------	0-18	20-27	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.28	5	5	2-4
	18-32	27-35	1.50-1.70	0.2-0.6	0.18-0.20	5.1-6.5	Moderate-----	0.37			
	32-40	27-35	1.50-1.70	0.2-0.6	0.15-0.19	6.1-7.3	Moderate-----	0.37			
	40-60	20-32	1.50-1.70	0.2-0.6	0.05-0.19	7.4-8.4	Low----------	0.37			
Urban land.											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
23A, 23B---------- Blount	C	None--------	---	---	1.0-3.0	Perched	Jan-May	High-----	High-----	High.
27B, 27C2, 27D2, 27E2---------- Miami	B	None--------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
56B---------- Dana	B	None--------	---	---	3.0-6.0	Perched	Mar-Apr	High-----	Moderate	Moderate.
67---------- Harpster	B/D	None--------	---	---	+.5-2.0	Apparent	Feb-Jun	High-----	High-----	Low.
73---------- Ross	B	Occasional	Very brief	Mar-Jun	>6.0	---	---	Moderate	Low------	Low.
91B---------- Swygert	C	None--------	---	---	1.0-3.0	Apparent	Feb-May	High-----	High-----	Low.
102A---------- La Hogue	B	None--------	---	---	1.0-3.0	Apparent	Feb-Jun	High-----	High-----	Moderate.
125---------- Selma	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Low.
131B---------- Alvin	B	None--------	---	---	>6.0	---	---	Moderate	Low------	High.
134B---------- Camden	B	None--------	---	---	>6.0	---	---	High-----	Low------	Moderate.
146B---------- Elliott	C	None--------	---	---	1.0-3.0	Perched	Mar-May	High-----	High-----	Moderate.
148B---------- Proctor	B	None--------	---	---	2.5-6.0	Apparent	Jan-May	High-----	Moderate	Moderate.
149A---------- Brenton	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
150B---------- Onarga	B	None--------	---	---	>6.0	---	---	Moderate	Low------	High.
152---------- Drummer	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
153---------- Pella	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
154A---------- Flanagan	B	None--------	---	---	1.0-3.0	Apparent	Apr-Jun	High-----	High-----	Moderate.
171B---------- Catlin	B	None--------	---	---	3.5-6.0	Apparent	Feb-May	High-----	High-----	Moderate.
194B, 194C2, 194D2---------- Morley	C	None--------	---	---	3.0-6.0	Perched	Mar-May	Moderate	High-----	Moderate.
198A---------- Elburn	B	None--------	---	---	1.0-3.0	Apparent	Jan-May	High-----	High-----	Moderate.
199B---------- Plano	B	None--------	---	---	3.0-6.0	Apparent	Mar-May	High-----	Moderate	Low.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
206---------- Thorp	C/D	Occasional	Brief-----	Mar-Jun	+.5-2.0	Apparent	Feb-Jun	High-----	High-----	Moderate.
219---------- Millbrook	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
221B, 221C2, 221D3---------- Parr	B	None--------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
223B2, 223C3------ Varna	C	None--------	---	---	3.0-6.0	Perched	Mar-May	High-----	Moderate	Moderate.
232---------- Ashkum	B/D	None--------	---	---	+1-2.0	Apparent	Apr-Jun	High-----	High-----	Moderate.
233B---------- Birkbeck	B	None--------	---	---	3.0-6.0	Apparent	Mar-May	High-----	High-----	Moderate.
234A---------- Sunbury	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
235---------- Bryce	D	None--------	---	---	+1-1.0	Apparent	Feb-Jun	High-----	High-----	Low.
236A---------- Sabina	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
241D---------- Chatsworth	D	None--------	---	---	>6.0	---	---	Moderate	High-----	Low.
242A---------- Kendall	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
243B---------- St. Charles	B	None--------	---	---	3.0-6.0	Apparent	Feb-Jun	High-----	Moderate	Moderate.
291B---------- Xenia	B	None--------	---	---	2.0-6.0	Apparent	Mar-Apr	High-----	High-----	Moderate.
302---------- Ambraw	B/D	Occasional	Brief-----	Mar-May	0-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
322C2---------- Russell	B	None--------	---	---	>6.0	---	---	High-----	Moderate	Moderate.
330---------- Peotone	B/D	None--------	---	---	+.5-1.0	Apparent	Feb-Jul	High-----	High-----	Moderate.
387B, 387C3------- Ockley	B	None--------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
398A---------- Wea	B	None--------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
533*. Urban land										
570B, 570C2, 570D2---------- Martinsville	B	None---------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
637---------- Muskego	A/D	None---------	---	---	+1-1.0	Apparent	Nov-Jun	High-----	Moderate	Moderate
802*. Orthents										
865*. Pits										
2027C*: Miami---------- Urban land.	B	None---------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
2152*: Drummer---------- Urban land.	B/D	None---------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
2154A*: Flanagan--------- Urban land.	B	None---------	---	---	1.0-3.0	Apparent	Apr-Jun	High-----	High-----	Moderate.
2171B*: Catlin---------- Urban land.	B	None---------	---	---	3.5-6.0	Apparent	Feb-May	High-----	High-----	Moderate.
2198A*: Elburn---------- Urban land.	B	None---------	---	---	1.0-3.0	Apparent	Jan-May	High-----	High-----	Moderate.
2236A*: Sabina----------	C	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.

)5	0.002 mm	Liquid limit	Plasticity index	Classification: AASHTO	Classification: Unified
		Pct			
5	26	38	15	A-6	CL
0	33	52	27	A-7-6	CH
9	20	26	11	A-6	CL
2	27	40	17	A-6	CL
7	35	56	29	A-7-6	CH
2	31	53	26	A-7-6	CH
7	29	40	22	A-7-6	CL
.6	19	26	11	A-7-6	CL
9	26	42	20	A-7-6	CL
2	36	51	26	A-7-6	CH
5	17	23	8	A-4	CL
4	28	35	11	A-6	ML
7	44	50	27	A-7-6	CH
4	31	38	16	A-6	CL

TABLE 18.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Alvin	Coarse-loamy, mixed, mesic Typic Hapludalfs
*Ambraw	Fine-loamy, mixed, mesic Fluvaquentic Haplaquolls
Ashkum	Fine, mixed, mesic Typic Haplaquolls
Birkbeck	Fine-silty, mixed, mesic Typic Hapludalfs
Blount	Fine, illitic, mesic Aeric Ochraqualfs
Brenton	Fine-silty, mixed, mesic Aquic Argiudolls
Bryce	Fine, mixed, mesic Typic Haplaquolls
Camden	Fine-silty, mixed, mesic Typic Hapludalfs
Catlin	Fine-silty, mixed, mesic Typic Argiudolls
Chatsworth	Fine, illitic, mesic Typic Eutrochrepts
Colo	Fine-silty, mixed, mesic Cumulic Haplaquolls
Dana	Fine-silty, mixed, mesic Typic Argiudolls
Drummer	Fine-silty, mixed, mesic Typic Haplaquolls
Elburn	Fine-silty, mixed, mesic Aquic Argiudolls
Elliott	Fine, illitic, mesic Aquic Argiudolls
Flanagan	Fine, montmorillonitic, mesic Aquic Argiudolls
Harpster	Fine-silty, mesic Typic Calciaquolls
*Jasper	Fine-loamy, mixed, mesic Typic Argiudolls
Kendall	Fine-silty, mixed, mesic Aeric Ochraqualfs
La Hogue	Fine-loamy, mixed, mesic Aquic Argiudolls
Martinsville	Fine-loamy, mixed, mesic Typic Hapludalfs
Miami	Fine-loamy, mixed, mesic Typic Hapludalfs
Millbrook	Fine-silty, mixed, mesic Udollic Ochraqualfs
Mona	Fine-loamy, mixed, mesic Typic Argiudolls
Morley	Fine, illitic, mesic Typic Hapludalfs
Muskego	Coprogenous, euic, mesic Limnic Medisaprists
Ockley	Fine-loamy, mixed, mesic Typic Hapludalfs
Odell	Fine-loamy, mixed, mesic Aquic Argiudolls
Onarga	Coarse-loamy, mixed, mesic Typic Argiudolls
Orthents	Loamy, mixed, nonacid, mesic Udorthents
Parr	Fine-loamy, mixed, mesic Typic Argiudolls
Pella	Fine-silty, mixed, mesic Typic Haplaquolls
Peotone	Fine, montmorillonitic, mesic Cumulic Haplaquolls
Plano	Fine-silty, mixed, mesic Typic Argiudolls
Proctor	Fine-silty, mixed, mesic Typic Argiudolls
Raub	Fine-silty, mixed, mesic Aquic Argiudolls
*Ross	Fine-loamy, mixed, mesic Cumulic Hapludolls
Russell	Fine-silty, mixed, mesic Typic Hapludalfs
Sabina	Fine, montmorillonitic, mesic Aeric Ochraqualfs
Selma	Fine-loamy, mixed, mesic Typic Haplaquolls
St. Charles	Fine-silty, mixed, mesic Typic Hapludalfs
Sunbury	Fine, montmorillonitic, mesic Aquollic Hapludalfs
Swygert	Fine, illitic, mesic Aquic Argiudolls
Thorp	Fine-silty, mixed, mesic Argiaquic Argialbolls
Varna	Fine, illitic, mesic Typic Argiudolls
Wea	Fine-loamy, mixed, mesic Typic Argiudolls
Xenia	Fine-silty, mixed, mesic Aquic Hapludalfs

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